

PRODUCT GUIDE 8



INVERTER/CHARGERS



CHARGE CONTROLLERS



COMMUNICATIONS



INTEGRATED SYSTEMS



ENERGY STORAGE



OutBack Power Technologies

Member of The Alpha Group

Masters of the Off-Grid™...

OutBack Power Technologies is the leading designer and manufacturer of advanced power conversion components and systems for renewable energy, backup, and mobile applications. From Baja to Bangladesh, from the Equator to the poles, OutBack components transform energy from renewable and conventional sources into the clean, reliable power that people need to transform the quality of their lives.

First Choice for the New Grid...

Identified by Pike Research as “far and away the leading vendor in the remote microgrid market,” OutBack’s leadership across all segments is rooted in the brand’s reputation for extreme reliability and dedication to technical innovation. The products here continue that tradition of excellence while bringing OutBack’s legendary off-grid technology and performance to an even wider range of energy production and power management applications.

A privately held company headquartered in Arlington, WA, OutBack Power is also a member of The Alpha Group—a global alliance of independent companies that share a common philosophy: create world-class powering solutions for communication, commercial, industrial and renewable energy markets. OutBack has pioneered many of the technologies that have become industry standards for power conversion technology, and there’s more to come.





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INVERTER/CHARGERS

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Radian™ Series

Inverter/Charger



Radian Series w/GSLC

With all the hallmark features you've come to expect from the Radian Series inverter/charger, the expanded Radian family includes four models, seven operating modes and two advanced new technologies designed to meet the unique requirements of the world's different regions.

Each new model offers seven operating modes and two advanced, future-ready technologies, including GridZero technology. GridZero technology, the newest of the Radian's seven input modes, provides the perfect balance between utility power and stored renewable energy.

By allowing a home or business to satisfy most of its power needs with renewable sources grid supplied power is only tapped when load demand exceeds a pre-set threshold. While the Radian is still grid-connected, grid dependence can be reduced to zero whenever possible. All of this means the Radian offers unmatched performance, reliability, value and system flexibility today and into the future.

Product Highlights:

- Grid-Interactive and Standalone Power Systems
- GridZero Technology Minimizes Grid Dependence*
- Various Frequency, Voltage and Phase Options
- Multiple Output Power Options
- Stackable and Scalable

High Performance, Pure Aesthetics

High-End Residential OutBack Grid/Hybrid System, Ozark Mountains, MO

Skywire Electrical Systems is a system integrator offering their commercial and residential clients everything from lighting design to solar electricity and thermal systems. As is typical of installers taking a custom, craftsman like approach, referrals from satisfied customers drive the business—and it was a grid-tied system installed in a residence that inspired a neighboring one to go all-out with energy independence, something highly desirable in a rugged mountain environment.

As always, Skywire responded with its best efforts, which included **multiple OutBack Power Radian Series inverter/chargers and other OutBack components in a 24kW PV/solar system.** Augmented by a 27kW generator, the complete system can power the residence through any outage or emergency. A key to selling such a comprehensive system was the OutBack brand itself. Notes Skywire owner James Bartley, "Our customers are impressed with the results, and OutBack's strong reputation in the industry gives them additional assurance as they transition to solar power."





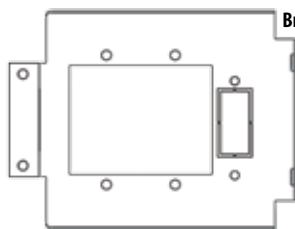
Radian™ Series

Inverter/Charger Specifications

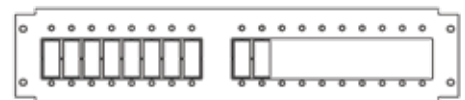
Models:	Domestic (For Selected North, Central and Latin American Countries)			International (For Europe, Asia and Global Countries)	
	GS8048	GS8048A	GS4048A	GS7048E	GS3548E
Nominal DC Input Voltage	48VDC	48VDC	48VDC	48VDC	48VDC
Continuous Output Power (@ 25°C)	8000VA	8000VA	4000VA	7000VA	3500VA
AC Output Voltage (Selectable)	120/240VAC	120/240VAC (200-260VAC)	120/240VAC (200-260VAC)	230VAC (210-250VAC)	230VAC (210-250VAC)
AC Output Frequency (Selectable)	60Hz	60Hz (50Hz)	60Hz (50Hz)	50Hz (60Hz)	50Hz (60Hz)
Continuous AC Output Current (@ 25°C)	33.3AAC @ 240VAC	33.3AAC @ 240VAC	16.7AAC	30AAC	15.2AAC
Idle Consumption (Invert Mode, No Load)	30W	34W	34W	34W	34W
Typical Efficiency	93%	93%	93%	92%	92%
CEC Weighted Efficiency	90%	92.5%	92.5%	—	—
Total Harmonic Distortion	Max. Total Harmonic: <5%, Max. Single Voltage Harmonic: <2%			Max. Total Harmonic: <5%, Max. Single Voltage Harmonic: <2%	
Output Voltage Regulation	±2%	±2%	±2%	±2%	±2%
Maximum Output Current	1ms Peak: 100AAC @ 240VAC, 200AAC @ 120VAC 100ms RMS: 70.7AAC @ 240VAC	1ms Peak: 100AAC @ 240VAC, 200AAC @ 120VAC 100ms RMS: 70.7AAC @ 240VAC	1ms Peak: 50AAC @ 240VAC 100ms RMS: 35.35AAC @ 240VAC	1ms Peak: 100AAC 100ms RMS: 70.7AAC	1ms Peak: 50AAC 100ms RMS: 35.35AAC
Overload Capacity	100ms Surge: 16.97kVA 5 Seconds: 12.0kVA 30 Minutes: 9.0kVA	100ms Surge: 16.97kVA 5 Seconds: 12.0kVA 30 Minutes: 9.0kVA	100ms Surge: 8.5kVA 5 Seconds: 6.0kVA 30 Minutes: 4.5kVA	100ms Surge: 16.3kVA 5 Seconds: 11.5kVA 30 Minutes: 7.9kVA	100ms Surge: 8.2kVA 5 Seconds: 5.8kVA 30 Minutes: 4.0kVA
AC Input Voltage Range (Adjustable)	(L1-N or L2-N) 70 to 140VAC	(L1-N or L2-N) 85 to 140VAC	(L1-N or L2-N) 85 to 140VAC	(L-N) 170 to 290VAC	(L-N) 170 to 290VAC
AC Input Frequency Range (Default)	54 to 66Hz @ 60Hz	54 to 66Hz @ 60Hz (45 to 55Hz @ 50Hz)		45 to 55Hz @ 50Hz (54 to 66Hz @ 60Hz)	
Grid-Interactive Voltage Range (Default)	(L1-N or L2-N) 106 to 132VAC	(L1-N or L2-N) 108 to 132VAC	(L1-N or L2-N) 108 to 132VAC	(L-N) 208 to 252VAC	(L-N) 208 to 252VAC
Grid-Interactive Frequency Range	59.3 to 60.5Hz	59.3 to 60.5Hz	59.3 to 60.5Hz	57.0 to 61.0Hz	57.0 to 61.0Hz
Maximum AC Input Current	50AAC @ 240VAC	50AAC @ 240VAC	50AAC @ 240VAC	50AAC	50AAC
Maximum Utility Interactive Current	32A	30A	15A	30A	15A
Continuous Battery Charge Output	115.0ADC	115.0ADC	57.5ADC	100.0ADC	50.0ADC
DC Input Voltage Range	40 to 64VDC	40 to 64VDC	40 to 64VDC	40 to 64VDC	40 to 64VDC
Temperature Range (Power derated above 25°C)	Rated: 0 to 50°C Maximum: -25 to 60°C	Rated: -20 to 50°C Maximum: -40 to 60°C	Rated: -20 to 50°C Maximum: -40 to 60°C	Rated: -20 to 50°C Maximum: -40 to 60°C	Rated: -20 to 50°C Maximum: -40 to 60°C
Accessory Ports	Remote Temperature Sensor, MATE3 & HUB Communications			Remote Temperature Sensor, MATE3 & HUB Communications	
Non-Volatile Memory	Yes	Yes	Yes	Yes	Yes
Field Upgradable Firmware	Yes	Yes	Yes	Yes	Yes
Chassis Type	Vented	Vented	Vented	Vented	Vented
Certifications	ETL Listed to UL1741, CSA C22.2 No. 107.1	ETL Listed to UL1741, CE, CSA C22.2 No. 107.1, UL 1778 Annex F, IEC 62109-1 ETL, RoHS compliant per directive 2011/65/EU, FCC Class B, IEEE 1547.1, EN61000-6-1, EN61000-6-3, EN61000-3-2, EN61000-3-3	ETL Listed to UL1741, CE, CSA C22.2 No. 107.1, UL 1778 Annex F, IEC 62109-1 ETL, RoHS compliant per directive 2011/65/EU, FCC Class B, IEEE 1547.1, EN61000-6-1, EN61000-6-3, EN61000-3-2, EN61000-3-3	IEC 62477-1, AS4777.2, AS4777.3, EN61000-6-1, EN61000-6-3, EN61000-3-2, EN61000-3-3, AS3100, CE, RoHS compliant per directive 2011/65/EU	IEC 62109-1, IEC 62477-1, AS4777.2, AS4777.3, EN61000-6-1, EN61000-6-3, EN61000-3-2, EN61000-3-3, AS3100, CE, RoHS compliant per directive 2011/65/EU
Warranty	Standard 5 year, available 10 year	Standard 5 year, available 10 year	Standard 5 year, available 10 year	Standard 5 year, available 10 year	Standard 5 year, available 10 year
Weight (lb/kg)	Unit: 125.0 / 56.7 Shipping: 140.0 / 63.5	Unit: 125.0 / 56.7 Shipping: 140.0 / 63.5	Unit: 82.0 / 37.2 Shipping: 94.0 / 42.6	Unit: 125.0 / 56.7 Shipping: 140.0 / 63.5	Unit: 81.0 / 36.7 Shipping: 93.0 / 42.1
Dimensions H x W x D (in/cm)	Unit: 28 x 16 x 8.7 / 71.1 x 40.6 x 22.1, Shipping: 34.5 x 21 x 14.5 / 87.6 x 53.3 x 36.8			Unit: 28 x 16 x 8.7 / 71.1 x 40.6 x 22.1, Shipping: 34.5 x 21 x 14.5 / 87.6 x 53.3 x 36.8	

Breaker Configuration Diagram

Holds up to eighteen 0.75" (19 mm) wide breakers, two 1.5" (39 mm) wide breakers and one FLEXnet DC. Support for optional AC Input-Output-Bypass Assembly. AC breakers are rated from 10-60A of AC current. A new double-pole 50A breaker is available to support 120/240V input and loads.



Breaker Panel (DC)



Breaker Panel



Radian™ Series GSLC

GS Load Center (GSLC) Balance-of-System Enclosure Specifications

Radian Series GS Load Center (GSLC)

The GSLC is a balance-of-systems enclosure designed to seamlessly integrate with the Radian Series inverter/chargers, FLEXmax charge controllers, and OutBack HUB communications manager. Three available models allow quick and easy installation of power systems of any size. Additional features of the GSLC line include its powder-coated galvanized chassis, ample knockout locations fitting 1/2" to 2" conduit, aesthetic stainless steel door and simple mounting to a Radian Series inverter/charger. It is listed to UL1741 and CSA C22.2 No. 107.1-01, is Type 1 indoor rated (IP30) and can also be used on its own as a separate breaker enclosure for use with other inverter models.



GSLC Knockout Location Diagram

Left Side	• (1) ½" knockout (0.875" diameter) • (7) 1" knockout (1.375" diameter) • (2) 2" knockout (2.468" diameter)	
Right Side	• (1) ½" knockout (0.875" diameter) • (4) 1" knockout (1.375" diameter) • (2) 2" knockout (2.468" diameter)	
Back Side	• (1) 2" knockout (2.468" diameter)	
Bottom Side	• (2) ½" knockout (0.875" diameter) • (2) ¾" knockout (1.109" diameter) • (2) 1" knockout (1.375" diameter) • (2) 1¼" knockout (1.734" diameter) • (1) 1½" knockout (1.984" diameter) • (2) 2" knockout (2.468" diameter)	
Top Side*	• (2) 1" knockout (1.375" diameter) • (2) 2" knockout (2.468" diameter)	

Installed Components	GSLC Model Numbers							
	GSLC	GSLC175-AC-120/240	GSLC175-120/240	GSLC175-230	GSLC175-PV-120/240	GSLC175-PV-230	GSLC175-PV1-120/240	GSLC175-PV1-230
Enclosure w/ Hinged Door	◆	◆	◆	◆	◆	◆	◆	◆
175A Breakers		2	2	2	2	2	1	1
Dual AC Inputs		◆	◆	◆	◆	◆	◆	◆
GFDI					◆	◆	◆	◆
FLEXnet DC					◆	◆	◆	◆
PV Disconnects					2	2	1	1
500A DC Shunt	1	1	1	1	3	3	2	2
120/240VAC Bypass		◆	◆		◆		◆	
230VAC Bypass				◆		◆		◆
ROCB, 4-50A 120/240 Circuit Breakers, Sliding Bypass Interlock		◆						
Weight (lb/kg)	Unit: 26 / 11.8 Shipping: 34 / 15.4	Unit: 40 / 18.1** Shipping: 45 / 20.4	Unit: 37 / 16.8 Shipping: 45 / 20.4	Unit: 37 / 16.8 Shipping: 45 / 20.4	Unit: 40 / 18.1** Shipping: 45 / 20.4	Unit: 40 / 18.1** Shipping: 45 / 20.4	Unit: 40 / 18.1** Shipping: 45 / 20.4	Unit: 40 / 18.1** Shipping: 45 / 20.4
Recommended Radian Model	GS8048 GS8048A GS4048A GS7035E GS3548E	GS8048 GS8048A GS4048A	GS8048 GS8048A GS4048A	GS7048E	GS8048 GS8048A	GS7048E	GS4048A	GS3548E



Radian™ Series

Sample Bill of Materials and Optional Accessories

Radian Series GSLC Sample Bill of Materials (w/Radian Series inverter/charger and dual FLEXmax charge controllers):

Part Number	Description	Quantity
GS8048A inverter/charger	8000W 120/240VAC grid-interactive and standalone solution with dual AC inputs	1
GSLC175-PV-120/240	Pre-wired GSLC with 175A inverter disconnects, GFDI and PV disconnects for two charge controllers, FLEXnet DC with 3 shunts, 120/240VAC inverter bypass and dual AC inputs	1
FLEXmax FM80-150VDC	80A output @ 40°C, 12 to 60VDC battery, 150VDC PV maximum	2
MATE3	Universal version, light gray square housing with Ethernet port	1
HUB4	Four port, up to 4 devices and one MATE	1
FW-MB3	Bracket for mounting a MATE3 system display on the side of Radian Series inverter/charger, GSLC, FW500 and FW1000 DC enclosures	1
FW-CCB2	Mounting bracket for two side mounted charge controllers on GSLC, FW500 and FW1000 DC enclosures	1

Radian Series GSLC Sample Bill of Materials (w/dual Radian Series inverter/chargers for UPS or AC only applications):

Part Number	Description	Quantity
GS8048A inverter/charger	8000W 120/240VAC grid-interactive and standalone solution with dual AC inputs	2
GSLC	GS load center for Radian Series inverter/charger, includes inverter bus bars, ground bus bar, 500ADC shunt assembly with negative TBB, neutral TBB and two STBB-RED bus bars.	2
PNL-175-DC	175A, 125VDC, 3/8" stud terminals	4
PNL-50D-AC-120/240	50A 120/240VAC Double Panel - Mount Breaker	6
MATE3	Universal version, light gray square housing with Ethernet port	1
HUB4	Four Port, up to 4 devices and one MATE	1
FW-MB3	Bracket for mounting a MATE3 system display on the side of Radian Series inverter/charger, GSLC, FW500 and FW1000 DC enclosures	1
FN-DC	FLEXnet DC monitors up to 3 shunts for improved battery management	1

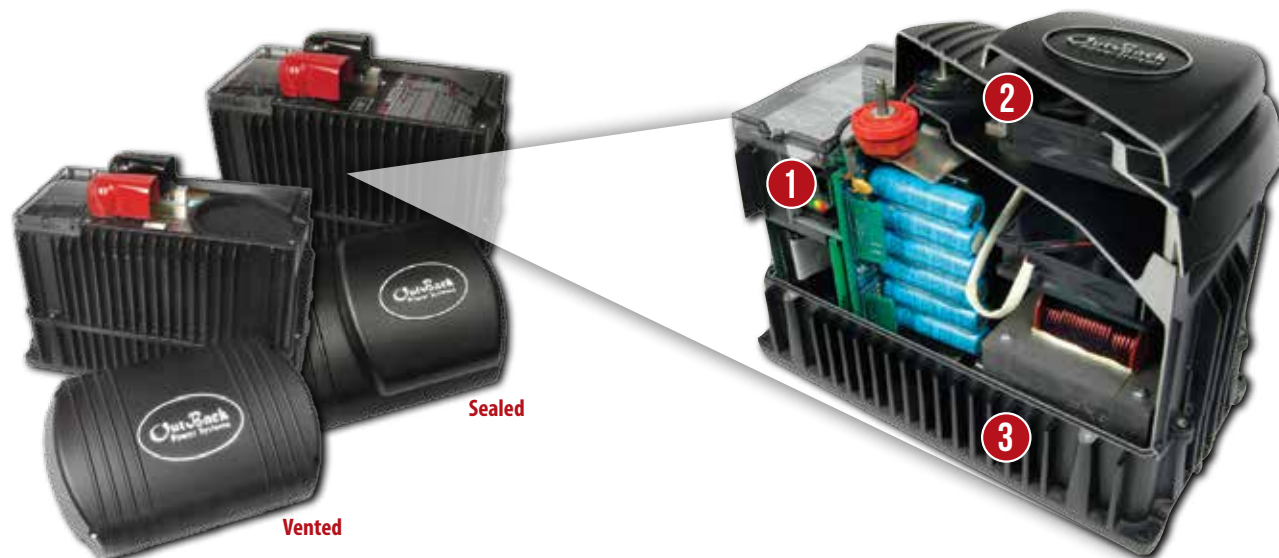
Accessories

Part Number	Description/Details
GS-SBUS	Shunt bus to connect three shunts together within the GSLC
STBB-BLACK	Bus bar with black insulators and mounting screws
STBB-RED	Bus bar with red insulators and mounting screws
STBB-WHITE	Bus bar with white insulators and mounting screws
PNL-50D-AC-120/240	Current rating: 50A (each of 2 poles), Voltage rating: 120/240VAC, Branch circuit: 5k AIC, Terminals: 1/4" stud, Width: 1.5" (39mm)
GS-IOB-120/240VAC Input-Output Bypass Assembly	Description: Field-installable kit for bypassing the AC input to the AC output for inverter maintenance or installation. Also provides overcurrent protection. Intended for use with single inverter installations. Includes: Four 50A 120/240VAC dual pole panel mount breakers, sliding bypass interlock plate, three STBB-BLACK and three STBB-RED terminal bus bars, wire and hardware kit. System rating: 120/240VAC @ 50A, Bypass breaker: Dual pole @ 50A, Input breakers: 175A, 2/0 AWG DC cable 15 inches (38 cm) long with ring terminals, Output Breaker: Dual pole @ 50A



FX/VFX Series

Off-Grid Sealed and Vented Inverter/Chargers



Pure Sinewave Technology

The appliances and electronics in a home or business need a clean, undistorted AC sinewave signal to operate properly. OutBack inverter/chargers use proprietary digital switching technology coupled to the custom, low-loss/high-efficiency transformer to deliver sinewave AC power that's actually cleaner than the electricity many utility companies can generate.

Internal Components

To achieve a whole that's greater than the sum of its parts, OutBack starts with inverter parts that meet or exceed the highest standards in place in their respective categories. Components are high-temperature rated to ensure exceptionally long operational life, and all critical assemblies are custom-built, right down to busbars and terminals. The all-critical transformer is a completely custom design, made with high-grade steel laminates and engineered for low-loss and high-efficiency operation. The transformer's base and framework incorporate a unique architecture to transfer or "wick" heat from the transformer directly to the inverter's chassis, enabling extra-high output and increasing reliability.

1 On-Board Intelligence

An OutBack inverter/charger can sense power outages, surges, or anything else affecting your service—and takes immediate steps to provide a backup (including starting a generator). It even has a standby/sleep mode to conserve power, waking up when lights or appliances require power, for example. An OutBack inverter/charger can protect itself from potential faults including an AC short and low/high battery voltage. OutBack inverter/chargers have superior surge capabilities and smarter battery charging algorithms—and almost all settings are user-adjustable for complete application customization.

2 Heat Management

Power-conversion means heat production. So the better an inverter manages heat, the more power it can produce. Typical inverters have to be vented in order to be adequately cooled. OutBack's sealed inverter design is behind a reputation that goes way beyond "adequate" and "typical," with an innovative internal forced-convection method to keep the inverter's temperature range optimal while keeping out dust, dirt and moisture. OutBack's vented inverters use similar thermal management technology to achieve industry-leading output for their size.

3 Inverter Chassis

Everything is housed in OutBack's distinctive cast-aluminum powder-coated chassis for a purely functional reason. Because cast aluminum can't bend or deform, it is ideal for protecting internal components and ensuring the mechanical precision necessary to maintain the tolerances and alignment an ultra-high quality sealed inverter demands. As with a high-performance engine block, OutBack's cast-aluminum frame is also superior at dissipating heat, and is a component of the inverter's advanced thermal management system.



FX/VFX

Off-Grid 60Hz/120V Inverter/Chargers

Models:	Sealed Models			Vented Models		
	FX2012T	FX2524T	FX3048T	VFX2812	VFX3524	VFX3648
Nominal DC Input Voltage	12VDC	24VDC	48VDC	12VDC	24VDC	48VDC
Continuous Power Rating (@ 25°C)	2000VA	2500VA	3000VA	2800VA	3500VA	3600VA
AC Frequency/Voltage	60Hz / 120VAC	60Hz / 120VAC	60Hz / 120VAC	60Hz / 120VAC	60Hz / 120VAC	60Hz / 120VAC
Continuous AC RMS Output (@25°C)	17AAC	20.8AAC	25AAC	23.3AAC	29.2AAC	30AAC
Idle Power	Full: ~20W Search: ~6W	Full: ~23W Search: ~6W	Full: ~23W Search: ~6W	Full: ~20W Search: ~6W	Full: ~20W Search: ~6W	Full: 23W Search: ~6W
Typical Efficiency	90%	93%	93%	90%	92%	93%
Total Harmonic Distortion	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%
Output Voltage Regulation	±2%	±2%	±2%	±2%	±2%	±2%
Maximum Output Current	Peak: 56AAC RMS: 40AAC	Peak: 70AAC RMS: 50AAC	Peak: 70AAC RMS: 50AAC	Peak: 56AAC RMS: 40AAC	Peak: 70AAC RMS: 50AAC	Peak: 70AAC RMS: 50AAC
AC Overload Capacity	Surge: 4800VA 5 Seconds: 4000VA 30 Minutes: 2500VA	Surge: 6000VA 5 Seconds: 4800VA 30 Minutes: 3200VA	Surge: 6000VA 5 Seconds: 4800VA 30 Minutes: 3200VA	Surge: 4800VA 5 Seconds: 4000VA 30 Minutes: 3200VA	Surge: 6000VA 5 Seconds: 5000VA 30 Minutes: 4000VA	Surge: 6000VA 5 Seconds: 5000VA 30 Minutes: 4000VA
AC Input Current Maximum	60AAC	60AAC	60AAC	60AAC	60AAC	60AAC
AC Input Voltage Range (MATE Adjustable)	80 to 150VAC	80 to 150VAC	80 to 150VAC	80 to 150VAC	80 to 150VAC	80 to 150VAC
AC Input Frequency Range	55 to 65Hz	55 to 65Hz	55 to 65Hz	54 to 66Hz	54 to 66Hz	54 to 66Hz
DC Input Voltage Range	10.5 to 17VDC	21 to 34VDC	42 to 68VDC	10.5 to 17VDC	21 to 34VDC	42 to 68VDC
Continuous Battery Charger Output	80ADC	55ADC	35ADC	125ADC	82ADC	45ADC
Temperature Range	Rated: 0 to 50°C (power derated above 25°C) Maximum*: -25 to 60°C			Rated: 0 to 50°C (power derated above 25°C) Maximum*: -25 to 60°C		
Certifications	ETL Listed to UL1741			ETL Listed to UL1741		
Warranty	Standard 5 year			Standard 5 year		
Weight (lb/kg)	Unit: 62 / 29 Shipping: 67 / 31			Unit: 61 / 28 Shipping: 67 / 31		
Dimensions H x W x L (in/cm)	Unit: 13 x 8.25 x 16.25 / 33 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56			Unit: 12 x 8.25 x 16.25 / 30.5 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56		

Powering Change in Paradise

Mini-Grid Powering the Community of Melano, Borneo

A fishing and pepper-farming village at the tip of East Malaysia, Melano is exceptionally isolated—unreachable by land, and accessible only after a long road-trip followed by an even longer boat trip. With both population and economic growth in place, Melano has reached the point where its homes, police station, community library and religious facilities are primed for modern conveniences and appliances powered by electricity. That's part of the reason why it was selected for the evaluation of a planned roll-out of mini-grid electrical systems what will ultimately serve similar communities throughout Malaysia.

For this pioneering effort, (2) OutBack FLEXpower systems were selected to run the 18.4kW mini-grid installation. **High output from a relatively compact size made FLEXpower an ideal choice in a place where every component must be brought in by small boat and hand-carried to the installation site on poles, and where reliability is paramount because a replacement is literally a voyage away.**

As the *Smart Grid Observer*** noted when citing a recent *Pike Research* report on remote micro-grids, "in the village power systems sub-segment, OutBack Power, which offers customized inverters and load controls optimized for rugged remote applications, is far and away the leading vendor."



*Functions, but does not necessarily meet all component specifications.

**June 15, 2012, "Remote Micro-Grids Poised for Growth"



FX/VFX

Off-Grid 60Hz/230V Inverter/Chargers

Models:	Sealed Models		Vented Models	
	FX2024WT	FX2348WT	VFX3024W	VFX3048W
Nominal DC Input Voltage	24VDC	48VDC	24VDC	48VDC
Continuous Power Rating (@ 25°C)	2000VA	2300VA	3000VA	3000VA
AC Frequency/Voltage	60Hz / 230VAC	60Hz / 230VAC	60Hz / 230VAC	60Hz / 230VAC
Continuous AC RMS Output (@25°C)	8.7AAC	10AAC	13AAC	13AAC
Idle Power	Full: ~20W Search: ~6W	Full: ~23W Search: ~6W	Full: ~20W Search: ~6W	Full: 20W Search: ~6W
Typical Efficiency	92%	93%	92%	93%
Total Harmonic Distortion	Typical: 2% Maximum: < 5%	Typical: 2% Maximum: < 5%	Typical: 2% Maximum: < 5%	Typical: 2% Maximum: < 5%
Output Voltage Regulation	±2%	±2%	±2%	±2%
Maximum Output Current	Peak: 35AAC RMS: 25AAC	Peak: 35AAC RMS: 25AAC	Peak: 35AAC RMS: 25AAC	Peak: 35AAC RMS: 25AAC
AC Overload Capacity	Surge: 5750VA 5 Seconds: 4800VA 30 Minutes: 3100VA	Surge: 5750VA 5 Seconds: 4800VA 30 Minutes: 3100VA	Surge: 5750VA 5 Seconds: 4800VA 30 Minutes: 3100VA	Surge: 5750VA 5 Seconds: 4800VA 30 Minutes: 3100VA
AC Input Current Maximum	30AAC	30AAC	30AAC	30AAC
AC Input Voltage Range (MATE Adjustable)	160 to 300VAC	160 to 300VAC	160 to 300VAC	160 to 300VAC
AC Input Frequency Range	54 to 66Hz	54 to 66Hz	54 to 66Hz	54 to 66Hz
DC Input Voltage Range	21 to 34VDC	42 to 68VDC	21 to 34VDC	42 to 68VDC
Continuous Battery Charger Output	55ADC	35ADC	85ADC	45ADC
Temperature Range	Rated: 0 to 50°C (power derated above 25°C) Maximum*: -25 to 60°C		Rated: 0 to 50°C (power derated above 25°C) Maximum*: -25 to 60°C	
Warranty	Standard 5 year		Standard 5 year	
Weight (lb/kg)	Unit: 62 / 29 Shipping: 67 / 31		Unit: 61 / 28 Shipping: 67 / 31	
Dimensions H x W x L (in/cm)	Unit: 13 x 8.25 x 16.25 / 33 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56		Unit: 12 x 8.25 x 16.25 / 30.5 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56	

Scaling New Heights in Power Generation

Rifugio Alimonta Climbing Lodge in the Italian Alps

The Dolomites have been a destination of world-class mountaineers for centuries. Its iconic peaks draw climbers and hikers from around the world, attracted by both the beauty and the challenge. The Rifugio (refuge) Alimonta was conceived and built to be their home away from home while exploring the peaks: a combination base, lodge and cafeteria at 8,464ft/2,580m altitude beautifully integrated into its magnificent surroundings.

Of course, being several kilometers higher than the closest electrical grid means that off-grid operation is a given—and with “next day air” wishful thinking, the choice of off-grid system components was driven by which brand could provide the ultimate balance between reliability and performance. Based on that criteria, **the choice of off-grid power components for this installation came down to a field of one: OutBack.** After all, for anyone or anything representing a peak of excellence the old saying holds true: it's always lonely at the top.



*Functions, but does not necessarily meet all component specifications.



J-Series FX/VFX

Off-Grid 50Hz/120V Inverter/Chargers for Jamaica and Other Markets

	Sealed Model	Vented Model
Models:	FX2024JT	VFX3024J
Nominal DC Input Voltage	24VDC	24VDC
Continuous Power Rating (@ 25°C)	2000VA	3000VA
AC Frequency/Voltage	50Hz / 120VAC	50Hz / 120VAC
Continuous AC RMS Output (@25°C)	16.7AAC	25AAC
Idle Power	Full: ~20W Search: ~6W	Full: ~20W Search: ~6W
Typical Efficiency	92%	92%
Total Harmonic Distortion	Typical: 2% Maximum: < 5%	Typical: 2% Maximum: < 5%
Output Voltage Regulation	±2%	±2%
Maximum Output Current	Peak: 70AAC RMS: 50AAC	Peak: 70AAC RMS: 50AAC
AC Overload Capacity	Surge: 6000VA 5 Seconds: 4800VA 30 Minutes: 3100VA	Surge: 6000VA 5 Seconds: 4800VA 30 Minutes: 3100VA
AC Input Current Maximum	60AAC	60AAC
AC Input Voltage Range (MATE Adjustable)	80 to 150VAC	80 to 150VAC
AC Input Frequency Range	44 to 56Hz	44 to 56Hz
DC Input Voltage Range	21 to 34VDC	21 to 34VDC
Continuous Battery Charger Output	55ADC	85ADC
Temperature Range	Rated: 0 to 50°C (power derated above 25°C) Maximum*: -25 to 60°C	Rated: 0 to 50°C (power derated above 25°C) Maximum*: -25 to 60°C
Warranty	Standard 5 year	Standard 5 year
Weight (lb/kg)	Unit: 62 / 29 Shipping: 67 / 31	Unit: 61 / 28 Shipping: 67 / 31
Dimensions H x W x L (in/cm)	Unit: 13 x 8.25 x 16.25 / 33 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56	Unit: 12 x 8.25 x 16.25 / 30.5 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56

An Island of Productivity

Former Sugar Plantation Converted into a Woodworking Facility, St. Kitts Island, West Indies

Like almost everything else on an island, energy has to come from someplace else. Which makes electricity from island-based power utilities both very expensive and often intermittent. Focusing on emerging markets in remote locations, Solar Nexus International designs and installs customized renewable energy systems ideal for island-based customers.

When one on St. Kitts wanted to convert an old plantation into a modern woodworking business, Solar Nexus needed something that could support high-powered electrical equipment day in and out while withstanding constant exposure to heat, salt air and high humidity—and also have the flexibility to draw on the grid only when needed and permit off-grid operation whenever possible.

Their PV/solar solution was built around OutBack's FLEXware 1000 platform with four inverter/chargers which can use the grid as a backup in HBX mode. The system's capacity was so strong that the owner was later able to use it to power the entire property—a fact that didn't surprise Solar Nexus CEO Eric Youngren, who said "for solar power in remote locations, OutBack is the best in the business."



*Functions, but does not necessarily meet all component specifications.



FX/VFX

Off-Grid 50Hz/230V Inverter/Chargers for Europe and International Markets

Models:	Sealed Models			Vented Models		
	FX2012ET	FX2024ET	FX2348ET	VFX2612E	VFX3024E	VFX3048E
Nominal DC Input Voltage	12VDC	24VDC	48VDC	12VDC	24VDC	48VDC
Continuous Power Rating (@ 25°C)	2000VA	2000VA	2300VA	2600VA	3000VA	3000VA
AC Frequency/Voltage	50Hz / 230VAC	50Hz / 230VAC	50Hz / 230VAC	50Hz / 230VAC	50Hz / 230VAC	50Hz / 230VAC
Continuous AC RMS Output (@25°C)	8.7AAC	8.7AAC	10AAC	11.3AAC	13AAC	13AAC
Idle Power	Full: ~20W Search: ~6W	Full: ~20W Search: ~6W	Full: ~23W Search: ~6W	Full: ~20W Search: ~6W	Full: ~20W Search: ~6W	Full: ~23W Search: ~6W
Typical Efficiency	90%	92%	93%	90%	92%	93%
Total Harmonic Distortion	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%
Output Voltage Regulation	±2%	±2%	±2%	±2%	±2%	±2%
Maximum Output Current	Peak: 28AAC RMS: 20AAC	Peak: 35AAC RMS: 25AAC	Peak: 35AAC RMS: 25AAC	Peak: 28AAC RMS: 20AAC	Peak: 35AAC RMS: 25AAC	Peak: 35AAC RMS: 25AAC
AC Overload Capacity	Surge: 4600VA 5 Seconds: 4000VA 30 Minutes: 2500VA	Surge: 5750VA 5 Seconds: 4800VA 30 Minutes: 3100VA	Surge: 5750VA 5 Seconds: 4800VA 30 Minutes: 3100VA	Surge: 4600VA 5 Seconds: 4000VA 30 Minutes: 3100VA	Surge: 5750VA 5 Seconds: 4800VA 30 Minutes: 3300VA	Surge: 5750VA 5 Seconds: 4800VA 30 Minutes: 3300VA
AC Input Current Maximum	30AAC	30AAC	30AAC	30AAC	30AAC	30AAC
AC Input Voltage Range (MATE Adjustable)	160 to 300VAC	160 to 300VAC	160 to 300VAC	160 to 300VAC	160 to 300VAC	160 to 300VAC
AC Input Frequency Range	44 to 56Hz	44 to 56Hz	44 to 56Hz	44 to 56Hz	44 to 56Hz	44 to 56Hz
DC Input Voltage Range	10.5 to 17VDC	21 to 34VDC	42 to 68VDC	10.5 to 17VDC	21 to 34VDC	42 to 68VDC
Continuous Battery Charger Output	100ADC	55ADC	35ADC	120ADC	85ADC	45ADC
Temperature Range	Rated: 0 to 50°C (power derated above 25°C) Maximum*: -25 to 60°C			Rated: 0 to 50°C (power derated above 25°C) Maximum*: -25 to 60°C		
Warranty	Standard 5 year			Standard 5 year		
Weight (lb/kg)	Unit: 62 / 29 Shipping: 67 / 31			Unit: 61 / 28 Shipping: 67 / 31		
Dimensions H x W x L (in/cm)	Unit: 13 x 8.25 x 16.25 / 33 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56			Unit: 12 x 8.25 x 16.25 / 30.5 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56		

A Cataclysm with a View

U.S. Cellular Base Transceiver Station (BTS) Overlooking Mount St. Helens, Washington

More than 4,000 feet up and right next to Mount St. Helens, the site of the most violent geological event in North American recorded history, it's safe to say that the U.S. Cellular BTS installation location is way beyond typical even for this typically-remote category. It is also an exceptionally challenging one for using renewable energy. Not only are there extremes of temperature to contend with, but the PV array must be mounted high enough to prevent it being buried by snow.

Solar power is essential to operating this station since propane fuel to run the generator must be brought in by snow-cat during the winter. And the station is essential in providing communications to the Forest Service personnel, hikers, researchers, and others frequenting this famous location. **The onsite renewable energy system uses twin OutBack VFX Series inverter/chargers and four FLEXmax charge controllers, which dependably power this remote, autonomous link to the outside world.**





OutBack Power Installations

Case Studies Featuring Inverter/Chargers with Customer Testimonials



Gulf South Solar—OutBack Grid/Hybrid Installation

"OutBack Power products are perfect for Louisiana's high-humidity, hostile climate because they continue working under tough conditions, which is why we install OutBack products and rely on them for our own office." —Jeff Shaw, Owner, South Gulf Solar



S.P.A.C.E.— OutBack Off-Grid Installation

"This OutBack Power solution allows us to uphold our commitment to providing clean, reliable power domestically and internationally in a system that is self-contained, mobile and secure." —Joey Romano, President, Adaptive Container LLC



Decorah Electric—OutBack Grid/Hybrid Installation

"This OutBack system is really going to be a win. with the MATE3, we can set parameters and use OutBack's new OPTICS RE web-enabled platform to monitor the system and troubleshoot remotely, without sending a truck out. It'll be a huge time and costs savings not to have to go to the site. Based on my experience with OutBack Power, I see no reason to ever use another vendor." —Joel Teslow, Decorah Electric



GTFX/GVFX Series

Grid-Interactive Sealed and Vented Inverter/Chargers



OutBack Power's true sinewave grid-interactive inverter/charger is a complete power solution. It incorporates a DC to AC sinewave inverter, battery charger and AC transfer switch housed within a die-cast aluminum chassis. The GTFX and GVFX Series inverter/charger gives you the ability to sell solar, wind or hydro power back to the utility grid while providing instantaneous backup power in the event of a utility outage.

Our built-in transfer switch automatically disconnects your loads from the utility grid and powers them from the inverter in the event of an outage, allowing you to continue using your solar and battery backup power, unlike traditional grid-tied systems.

Intelligent multi-stage battery charging prolongs the life of your batteries and built-in networked communications enables you to stack up to two units while simultaneously communicating with other OutBack Power components. The exclusive modular system architecture means that increased power output is just an additional inverter/charger away.

Product Highlights:

- Sinewave Output
- Intelligent Battery Charging
- Bug-Proof Chassis
- Field Serviceable

Preserving the Vintage

Laurel Ridge Winery, Oregon

Lite Solar Corporation is an innovator in Power Purchase Agreement (PPA) back-up systems for a range of customers in retail, hospitality, education, farms and wineries. That last category is particularly sensitive to electricity prices and supply, since high utility power costs and frequent outages greatly affect the bottom line—especially in Oregon's wine country region in wintertime.

Lite Solar selected the OutBack Radian Series inverter/charger for Laurel Ridge Winery's solar electric system for its multiple operational modes and design flexibility, enabling the winery to take advantage of all available incentives while also maintaining operations during outages and making a brand-enhancing environmental statement.

Project manager Mike Middleton explains the Radian advantage: "Our customers expect worry-free, low-expense solar energy systems that operate no matter the location or environmental conditions. OutBack Radian Series inverter/chargers allow us to build backup power that customers can tap into during emergencies in order to continue business operations as usual."





GTFX/GVFX

Grid-Interactive 60Hz/120V Inverter/Chargers

Models:	Sealed Models		Vented Models	
	GTFX2524	GTFX3048	GVFX3524	GVFX3648
Nominal DC Input Voltage	24VDC	48VDC	24VDC	48VDC
Continuous Power Rating (@ 25°C)	2500VA	3000VA	3500VA	3600VA
AC Frequency/Voltage	60Hz / 120VAC	60Hz / 120VAC	60Hz / 120VAC	60Hz / 120VAC
Continuous AC RMS Output (@25°C)	20.8AAC	25AAC	29.2AAC	30AAC
Idle Power	Full: ~20W Search: ~6W	Full: ~23W Search: ~6W	Full: ~20W Search: ~6W	Full: ~23W Search: ~6W
Typical Efficiency	92%	93%	92%	93%
Total Harmonic Distortion	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%
Output Voltage Regulation	±2%	±2%	±2%	±2%
Maximum Output Current	Peak: 70AAC RMS: 50AAC	Peak: 70AAC RMS: 50AAC	Peak: 70AAC RMS: 50AAC	Peak: 70AAC RMS: 50AAC
AC Overload Capacity	Surge: 6000VA 5 Seconds: 4800VA 30 Minutes: 3200VA	Surge: 6000VA 5 Seconds: 4800VA 30 Minutes: 3200VA	Surge: 6000VA 5 Seconds: 5000VA 30 Minutes: 4000VA	Surge: 6000VA 5 Seconds: 5000VA 30 Minutes: 4000VA
AC Input Current Maximum	60AAC	60AAC	60AAC	60AAC
Grid-Interactive Voltage Range*	108 to 132VAC	108 to 132VAC	108 to 132VAC	108 to 132VAC
Grid-Interactive Frequency Range*	59.3 to 60.5Hz	59.3 to 60.5Hz	59.3 to 60.5Hz	59.3 to 60.5Hz
AC Input Voltage Range	108 to 132VAC	108 to 132VAC	108 to 132VAC	108 to 132VAC
AC Input Frequency Range	55 to 65Hz	55 to 65Hz	55 to 65Hz	55 to 65Hz
DC Input Voltage Range	21 to 34VDC	42 to 68VDC	21 to 34VDC	42 to 68VDC
Maximum DC Current (@ Rated Power)	125ADC	75ADC	175ADC	90ADC
Continuous Battery Charger Output	55ADC	35ADC	85ADC	45ADC
Certifications	ETL Listed to UL1741, CSA C22.2 No. 107.1	ETL Listed to UL1741, CSA C22.2 No. 107.1	ETL Listed to UL1741, CSA C22.2 No. 107.1	ETL Listed to UL1741, CSA C22.2 No. 107.1
Temperature Range	Rated: 0 to 50°C (power derated above 25°C) Maximum**: -25 to 60°C		Rated: 0 to 50°C (power derated above 25°C) Maximum**: -25 to 60°C	
Warranty	Standard 5 year, available 10 year		Standard 5 year, available 10 year	
Weight (lb/kg)	Unit: 62 / 29 Shipping: 67 / 31		Unit: 61 / 28 Shipping: 67 / 31	
Dimensions H x W x L (in/cm)	Unit: 13 x 8.25 x 16.25 / 33 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56		Unit: 12 x 8.25 x 16.25 / 30.5 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56	

*This product was designed to meet UL1741 specifications within the US and Canada. Please check local nominal power voltage ratings in areas where grid specifications might fluctuate.

**Functions, but does not necessarily meet all component specifications.



GTFX/GVFX

Grid-Interactive 60Hz/127V Inverter/Chargers for Mexico and Other Markets

60Hz/127V Models*:	Sealed Models		Vented Models	
	GTFX2524LA	GTFX3048LA	GVFX3524LA	GVFX3648LA
Nominal DC Input Voltage	24VDC	48VDC	24VDC	48VDC
Continuous Power Rating (@ 25°C)	2500VA	3000VA	3500VA	3600VA
AC Frequency/Voltage	60Hz / 127VAC	60Hz / 127VAC	60Hz / 127VAC	60Hz / 127VAC
Continuous AC RMS Output (@25°C)	19.7AAC	23.6AAC	27.6AAC	28.4AAC
Idle Power	Full: ~23W Search: ~6W	Full: 20W Search: ~6W	Full: ~23W Search: ~6W	Full: 20W Search: ~6W
Typical Efficiency	92%	93%	92%	93%
Total Harmonic Distortion	Inverting: 2% Selling: < 5%	Inverting: 2% Selling: < 5%	Inverting: 2% Selling: < 5%	Inverting: 2% Selling: < 5%
Output Voltage Regulation	±2%	±2%	±2%	±2%
Maximum Output Current	Peak: 70AAC RMS: 50AAC	Peak: 70AAC RMS: 50AAC	Peak: 70AAC RMS: 50AAC	Peak: 70AAC RMS: 50AAC
AC Overload Capacity	Surge: 6000VA 5 Seconds: 4800VA 30 Minutes: 3200VA	Surge: 6000VA 5 Seconds: 4800VA 30 Minutes: 3200VA	Surge: 6000VA 5 Seconds: 5000VA 30 Minutes: 4000VA	Surge: 6000VA 5 Seconds: 5000VA 30 Minutes: 4000VA
AC Input Current Maximum	60AAC	60AAC	60AAC	60AAC
AC Input Voltage Range (MATE Adjustable)	100 to 140VAC	100 to 140VAC	100 to 140VAC	100 to 140VAC
AC Input Frequency Range	58 to 62Hz	58 to 62Hz	58 to 62Hz	58 to 62Hz
DC Input Voltage Range	21 to 34VDC	42 to 68VDC	21 to 34VDC	42 to 68VDC
Continuous Battery Charger Output	55ADC	35ADC	85ADC	45ADC
Temperature Range	Rated: 0 to 50°C (power derated above 25°C) Maximum**: -25 to 60°C		Rated: 0 to 50°C (power derated above 25°C) Maximum**: -25 to 60°C	
Warranty	Standard 5 year		Standard 5 year	
Weight (lb/kg)	Unit: 62 / 29 Shipping: 67 / 31		Unit: 61 / 28 Shipping: 67 / 31	
Dimensions H x W x L (in/cm)	Unit: 13 x 8.25 x 16.25 / 33 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56		Unit: 12 x 8.25 x 16.25 / 30.5 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56	

High-Tech Homesteading

Luxury Off-Grid Modular Homes, Ojai, CA and Other Locations

For those who want to live in remote locations surrounded by natural beauty, options are limited and costly. Enter Modular Lifestyles of Irvine, CA, an innovator in self-sufficient modular homes designed for people who want to “get away from it all” without getting in over their heads or giving up on basic amenities.

The company uses a range of green building technologies including tankless hot water heating, greywater recycling/reclamation, and LED lighting for maximum efficiency, and equips off-grid models with OutBack FLEXpower TWO pre-wired and tested systems for providing energy autonomy for people living miles away from the nearest utility services, such as in desert and mountain environments.

The company's vice president Steven Lefler explains that their “mission was to build an efficient, green residence that would work well both off-grid and on... solving many of the problems associated with affordable housing.” By combining leading-edge green technology with advanced manufactured home design, Modular Lifestyles is opening up living possibilities to a wide range of homeowners, including seniors looking at more active retirement options.





GTFX/GVFX

Grid-Interactive 50Hz/230V Inverter/Chargers

50Hz/230V Models:	Sealed Models			Vented Models		
	GTFX2012E	GTFX2024E	GTFX2348E	GVFX2612E	GVFX3024E	GVFX3048E
Nominal DC Input Voltage	12VDC	24VDC	48VDC	12VDC	24VDC	48VDC
Continuous Power Rating (@ 25°C)	2000VA	2000VA	2300VA	2600VA	3000VA	3000VA
AC Frequency/Voltage	50Hz / 230VAC	50Hz / 230VAC	50Hz / 230VAC	50Hz / 230VAC	50Hz / 230VAC	50Hz / 230VAC
Continuous AC RMS Output (@25°C)	8.7AAC	8.7AAC	10AAC	11.3AAC	13AAC	13AAC
Idle Power	Full: ~20W Search: ~6W	Full: ~20W Search: ~6W	Full: ~23W Search: ~6W	Full: ~20W Search: ~6W	Full: ~20W Search: ~6W	Full: ~23W Search: ~6W
Typical Efficiency	90%	92%	92%	90%	92%	93%
Total Harmonic Distortion	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%
Output Voltage Regulation	±2%	±2%	±2%	±2%	±2%	±2%
Maximum Output Current	Peak: 28AAC RMS: 20AAC	Peak: 35AAC RMS: 25AAC	Peak: 35AAC RMS: 25AAC	Peak: 28AAC RMS: 20AAC	Peak: 35AAC RMS: 25AAC	Peak: 35AAC RMS: 25AAC
AC Overload Capacity	Surge: 4600VA 5 Seconds: 4000VA 30 Minutes: 2500VA	Surge: 5750VA 5 Seconds: 4800VA 30 Minutes: 3100VA	Surge: 5750VA 5 Seconds: 4800VA 30 Minutes: 3100VA	Surge: 4600VA 5 Seconds: 4000VA 30 Minutes: 3100VA	Surge: 5750VA 5 Seconds: 4800VA 30 Minutes: 3300VA	Surge: 5750VA 5 Seconds: 4800VA 30 Minutes: 3300VA
AC Input Current Maximum	30AAC	30AAC	30AAC	30AAC	30AAC	30AAC
AC Input Voltage Range (MATE Adjustable)	160 to 300VAC	160 to 300VAC	160 to 300VAC	160 to 300VAC	160 to 300VAC	160 to 300VAC
AC Input Frequency Range	44 to 56Hz	44 to 56Hz	44 to 56Hz	44 to 56Hz	44 to 56Hz	44 to 56Hz
DC Input Voltage Range	10.5 to 17VDC	21 to 34VDC	42 to 68VDC	10.5 to 17VDC	21 to 34VDC	42 to 68VDC
Continuous Battery Charger Output	100ADC	55ADC	35ADC	120ADC	85ADC	45ADC
Temperature Range	Rated: 0 to 50°C (power derated above 25°C) Maximum*: -25 to 60°C			Rated: 0 to 50°C (power derated above 25°C) Maximum*: -25 to 60°C		
Warranty	Standard 5 year			Standard 5 year		
Weight (lb/kg)	Unit: 62 / 29 Shipping: 67 / 31			Unit: 61 / 28 Shipping: 67 / 31		
Dimensions H x W x L (in/cm)	Unit: 13 x 8.25 x 16.25 / 33 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56			Unit: 12 x 8.25 x 16.25 / 30.5 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56		

A Solar Lift for Quality of Life

Solar Generating Stations, Various Rural Navajo Nation Settlements, New Mexico

With over 18,000 Native American homes currently without electricity—many of them in remote rural areas far away from power lines—bringing modern amenities to tribal citizens means onsite generation. With the goal of reducing dependency on diesel, kerosene and propane in remote settlements, various Federal agencies work with Sacred Power, a Native American-owned and operated renewable energy system integrator, to engineer a cost-effective remote solution for powering refrigeration, lighting, and other quality of life necessities.

Sacred Power's 650 pre-assembled systems are built around OutBack Power's FLEXpower ONE platform because of its extreme-environment engineering and flexibility to support a wide variety of electrical loads. Onsite renewable electricity generation not only provides the basics of better living, but also improves health by reducing diesel and kerosene fumes and generator noise, and enables Native American artisans to achieve higher incomes through e-commerce.

On Sacred Power's choice of technology providers, co-owner Odes Armijo-Caster explains "we use OutBack products. . .because we needed a 24/7 reliable system for extreme environments. OutBack delivers electricity for activities many may take for granted."



*Functions, but does not necessarily meet all component specifications.



M-Series Mobile/Marine

Specialized Application 60Hz/120V Inverter/Chargers



OutBack's Mobile and Marine inverter/charger models provide high performance and reliability wherever your travels take you. The die-cast metal construction allows mounting in any position, even upside down.

The required AC input neutral/ground switching is taken care of by a fully-integrated 30AAC transfer switch for shore power or generator hook-up. Three circuit boards and a simple design allow simple field servicing in any location. Rigorous factory testing ensures each inverter/charger exhibits efficiency and reliability on the first day of operation, as well as for many years to come.

Product Highlights:

- True Sinewave Output
- Intelligent Battery Charging
- Modular, Stackable Design

Models:	Sealed Models					Vented Models				
	FX2012MT	FX2524MT	FX2532MT	FX2536MT	FX3048MT	VFX2812M	VFX3524M	VFX3232M	VFX3236M	VFX3648M
Nominal DC Input Voltage	12VDC	24VDC	32VDC	36VDC	48VDC	12VDC	24VDC	32VDC	36VDC	48VDC
Continuous Power Rating (@ 25°C)	2000VA	2500VA	2500VA	2500VA	3000VA	2800VA	3500VA	3200VA	3200VA	3600VA
AC Frequency/Voltage	60Hz / 120VAC	60Hz / 120VAC	60Hz / 120VAC	60Hz / 120VAC	60Hz / 120VAC	60Hz / 120VAC	60Hz / 120VAC	60Hz / 120VAC	60Hz / 120VAC	60Hz / 120VAC
Continuous AC RMS Output (@25°C)	17AAC	20.8AAC	20.8AAC	20.8AAC	25AAC	23.3AAC	29.2AAC	26.6AAC	26.6AAC	30AAC
Idle Power	Full: ~20W Search: ~6W	Full: ~20W Search: ~6W	Full: ~21W Search: ~6W	Full: ~21W Search: ~6W	Full: ~23W Search: ~6W	Full: ~20W Search: ~6W	Full: ~20W Search: ~6W	Full: ~21W Search: ~6W	Full: ~21W Search: ~6W	Full: ~23W Search: ~6W
Typical Efficiency	90%	92%	92%	92%	93%	90%	92%	92%	92%	93%
Total Harmonic Distortion	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%
Output Voltage Regulation	±2%	±2%	±2%	±2%	±2%	±2%	±2%	±2%	±2%	±2%
Maximum Output Current	Peak: 56AAC RMS: 50AAC	Peak: 70AAC RMS: 50AAC	Peak: 56AAC RMS: 40AAC	Peak: 56AAC RMS: 40AAC	Peak: 70AAC RMS: 50AAC	Peak: 56AAC RMS: 50AAC	Peak: 70AAC RMS: 50AAC	Peak: 56AAC RMS: 40AAC	Peak: 56AAC RMS: 40AAC	Peak: 70AAC RMS: 50AAC
AC Overload Capacity	Surge: 4800VA 5 Sec: 4000VA 30 Min: 2500VA	Surge: 6000VA 5 Sec: 4800VA 30 Min: 3200VA	Surge: 4800VA 5 Sec: 4000VA 30 Min: 2500VA	Surge: 4800VA 5 Sec: 4000VA 30 Min: 2500VA	Surge: 6000VA 5 Sec: 4800VA 30 Min: 3200V	Surge: 4800VA 5 Sec: 4000VA 30 Min: 3200VA	Surge: 6000VA 5 Sec: 5000VA 30 Min: 4000V	Surge: 4800VA 5 Sec: 4000VA 30 Min: 4000VA	Surge: 4800VA 5 Sec: 4000VA 30 Min: 2500VA	Surge: 6000VA 5 Sec: 5000VA 30 Min: 4000V
AC Input Current Maximum	30AAC	30AAC	30AAC	30AAC	30AAC	30AAC	30AAC	30AAC	30AAC	30AAC
AC Input Voltage Range (MATE Adjustable)	80 to 150VAC	80 to 150VAC	80 to 150VAC	80 to 150VAC	80 to 150VAC	80 to 150VAC	80 to 150VAC	80 to 150VAC	80 to 150VAC	80 to 150VAC
AC Input Frequency Range	54 to 66Hz	54 to 66Hz	54 to 66Hz	54 to 66Hz	54 to 66Hz	54 to 66Hz	54 to 66Hz	54 to 66Hz	54 to 66Hz	54 to 66Hz
Neutral-Ground Bond Switching	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DC Input Voltage Range	10.5 to 17VDC	21 to 34VDC	28 to 45.3VDC	31.5 to 51VDC	42 to 68VDC	10.5 to 17VDC	21 to 34VDC	28 to 45.3VDC	31.5 to 51VDC	42 to 68VDC
Continuous Battery Charger Output	80ADC	55ADC	35ADC	35ADC	35ADC	125ADC	85ADC	45ADC	45ADC	45ADC
Temperature Range	Rated: 0 to 50°C (power derated above 25°C) Maximum*: -25 to 60°C					Rated: 0 to 50°C (power derated above 25°C) Maximum*: -25 to 60°C				
Certifications	ETL Listed to UL458					ETL Listed to UL458				
Warranty	Standard 5 year					Standard 5 year				
Weight (lb/kg)	Unit: 62 / 29 Shipping: 67 / 31					Unit: 61 / 28 Shipping: 67 / 31				
Dimensions H x W x L (in/cm)	Unit: 13 x 8.25 x 16.25 / 33 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56					Unit: 12 x 8.25 x 16.25 / 30.5 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56				



M-Series Mobile/Marine

Specialized Application 50Hz/230V Inverter/Chargers

Models:	Sealed Models			Vented Models		
	FX2012EMT	FX2024EMT	FX2348EMT	VFX2612EM	VFX3024EM	VFX3048EM
Nominal DC Input Voltage	12VDC	24VDC	48VDC	12VDC	24VDC	48VDC
Continuous Power Rating (@ 25°C)	2000VA	2000VA	2300VA	2600VA	3000VA	3000VA
AC Frequency/Voltage	50Hz / 230VAC	50Hz / 230VAC	50Hz / 230VAC	50Hz / 230VAC	50Hz / 230VAC	50Hz / 230VAC
Continuous AC RMS Output (@25°C)	8.7AAC	8.7AAC	10AAC	11.3AAC	13AAC	13AAC
Idle Power	Full: ~20W Search: ~6W	Full: ~20W Search: ~6W	Full: ~23W Search: ~6W	Full: ~20W Search: ~6W	Full: ~20W Search: ~6W	Full: ~23W Search: ~6W
Typical Efficiency	90%	92%	93%	90%	92%	93%
Total Harmonic Distortion	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%
Output Voltage Regulation	±2%	±2%	±2%	±2%	±2%	±2%
Maximum Output Current	Peak: 28AAC RMS: 20AAC	Peak: 35AAC RMS: 25AAC	Peak: 35AAC RMS: 25AAC	Peak: 28AAC RMS: 20AAC	Peak: 35AAC RMS: 25AAC	Peak: 35AAC RMS: 25AAC
AC Overload Capacity	Surge: 4600VA 5 Seconds: 4000VA 30 Minutes: 2500VA	Surge: 5750VA 5 Seconds: 4800VA 30 Minutes: 3100VA	Surge: 5750VA 5 Seconds: 4800VA 30 Minutes: 3100VA	Surge: 4600VA 5 Seconds: 4000VA 30 Minutes: 3100VA	Surge: 5750VA 5 Seconds: 4800VA 30 Minutes: 3300VA	Surge: 5750VA 5 Seconds: 4800VA 30 Minutes: 3300VA
AC Input Current Maximum	30AAC	30AAC	30AAC	30AAC	30AAC	30AAC
AC Input Voltage Range (MATE Adjustable)	160 to 300VAC	160 to 300VAC	160 to 300VAC	160 to 300VAC	160 to 300VAC	160 to 300VAC
AC Input Frequency Range	44 to 56Hz	44 to 56Hz	44 to 56Hz	44 to 56Hz	44 to 56Hz	44 to 56Hz
Neutral-Ground Bond Switching	✓	✓	✓	✓	✓	✓
DC Input Voltage Range	10.5 to 17VDC	21 to 34VDC	42 to 68VDC	10.5 to 17VDC	21 to 34VDC	42 to 68VDC
Continuous Battery Charger Output	100ADC	55ADC	35ADC	120ADC	85ADC	45ADC
Temperature Range	Rated: 0 to 50°C (power derated above 25°C) Maximum*: -25 to 60°C			Rated: 0 to 50°C (power derated above 25°C) Maximum*: -25 to 60°C		
Warranty	Standard 5 year			Standard 5 year		
Weight (lb/kg)	Unit: 62 / 29 Shipping: 67 / 31			Unit: 61 / 28 Shipping: 67 / 31		
Dimensions H x W x L (in/cm)	Unit: 13 x 8.25 x 16.25 / 33 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56			Unit: 12 x 8.25 x 16.25 / 30.5 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56		

Sailing the Seven Seas with Assurance

On-Board Electrical Systems on Yachts from 40-120 Feet, Worldwide Maritime

Boasting the highest circumnavigation rates in the industry of any single brand, Nordhavn Yachts bring new meaning to the phrase “mission-critical” for an electrical system. With the nearest port of call possibly thousands of miles away, on-board power for communications and navigation systems is a vital concern for Nordhavn’s clientele, especially in the event of engine failure where the batteries and inverter must take up the entire load.

Nordhavn now includes OutBack FX Series inverter/chargers and other components as standard equipment on selected vessels for their performance, dependability, and all-out resistance to harsh marine conditions through their sealed design and precision build quality.

Most important, OutBack contributes to the overall Nordhavn brand experience for owners who expect peace-of-mind to be an integral part of their deep-sea activities. Nordhavn engineer Mike Tellaria sums it up this way: “OutBack Power allows us to design electrical systems that meet the marine-quality demands of our customers. . . the company provides a measurable level of reliability, convenience and safety to every one of our boats.”



*Functions, but does not necessarily meet all component specifications.



OBX Extreme Series

Specialized Application 60Hz/120V Inverter/Chargers



Built from exceptionally rugged components not available in regular commercial “off-the-shelf” inverter/chargers, the water-resistant OBX Extreme Series inverter/chargers are designed to survive harsh environmental conditions including shock and vibration.

Additional features of the OBX include intelligent battery charging and an integrated AC transfer relay with automatic neutral-ground switching for mobile applications. A “mount anywhere” design and silent operation, along with low-distortion pure sinewave power output, makes the OBX ideal for mobile electrical needs, and their ample surge capability can start multiple heavy loads simultaneously.

Product Highlights:

- Highly Reliable, All-in-One Power Solutions
- True Sinewave AC Output
- Efficient Battery Charging
- High Surge Power Capability

Models:	OBXIC2024S120/60*	OBXGIC2524P120/60	OBXIC3524P120/60
Nominal DC Input Voltage	24VDC	24VDC	24VDC
Continuous Power Rating (@ 25°C)	2000VA	2500VA	3500VA
AC Frequency/Voltage	60Hz / 120VAC	60Hz / 120VAC	60Hz / 120VAC
Continuous AC RMS Output (@ 25°C)	16.7AAC	20.8AAC	29.2AAC
Idle Power	Full: ~20W Search: ~6W	Full: ~20W Search: ~6W	Full: 20W Search: ~6W
Typical Efficiency	92%	92%	92%
Total Harmonic Distortion	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%
Output Voltage Regulation	±2%	±2%	±2%
Maximum Output Current	Peak: 70AAC RMS: 50AAC	Peak: 70AAC RMS: 50AAC	Peak: 70AAC RMS: 50AAC
AC Overload Capacity	Surge: 6000VA 5 Sec: 4800VA 30 Min: 3200VA	Surge: 6000VA 5 Sec: 4800VA 30 Min: 3200VA	Surge: 6000VA 5 Sec: 5000VA 30 Min: 4000V
AC Input Current Maximum	30AAC	30AAC	30AAC
AC Input Voltage Range (MATE Adjustable)	80 to 150VAC	80 to 150VAC	80 to 150VAC
AC Input Frequency Range	54 to 66Hz	54 to 66Hz	54 to 66Hz
DC Input Voltage Range	21 to 34VDC	21 to 34VDC	21 to 34VDC
Continuous Battery Charger Output	55ADC	55ADC	85ADC
Recommended Battery Cable	#2/0 AWG	#2/0 AWG	#2/0 AWG
Recommended Battery Types	Flooded Lead Acid, AGM, Gel	Flooded Lead Acid, AGM, Gel	Flooded Lead Acid, AGM, Gel
Neutral-Ground Bond Switching	✓	✓	
Chassis	Sealed / foldable	Sealed	Vented
Temperature Range	Rated: 0 to 50°C (power derated above 25°C) Maximum**: -25 to 60°C	Rated: 0 to 50°C (power derated above 25°C) Maximum**: -25 to 60°C	Rated: 0 to 50°C (power derated above 25°C) Maximum**: -25 to 60°C
Warranty	Standard 5 year	Standard 5 year	Standard 5 year
Weight (lb/kg)	Unit: 57.5 / 26 Shipping: 65 / 29.5	Unit: 62 / 29 Shipping: 67 / 31	Unit: 62 / 29 Shipping: 67 / 31
Dimensions H x W x L (in/cm)	Unit: 12 x 8.25 x 16.25 / 33 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56	Unit: 12 x 8.25 x 16.25 / 33 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56	Unit: 12 x 8.25 x 16.25 / 33 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56



OBX Extreme Series

Specialized Application 50Hz/230V Inverter/Chargers

Models: OBXIC2024P230/50

Nominal DC Input Voltage	24VDC
Continuous Power Rating (@ 25°C)	2000VA
AC Frequency / Voltage	50Hz / 230VAC
Continuous AC RMS Output (@25°C)	8.7AAC
Idle Power	Full: ~20W Search: ~6W
Typical Efficiency	92%
Total Harmonic Distortion	Typical: 2% Maximum: 5%
Output Voltage Regulation	±2%
Maximum Output Current	Peak: 35AAC RMS: 25AAC
AC Overload Capacity	Surge: 5750VA 5 Sec: 4800VA 30 Min: 3100VA
AC Input Current Maximum	30AAC
AC Input Voltage Range (MATE Adjustable)	160 to 300VAC
AC Input Frequency Range	44 to 56Hz
DC Input Voltage Range	21 to 34VDC
Continuous Battery Charger Output	55ADC
Recommended Battery Cable	#2/0 AWG
Recommended Battery Types	Flooded Lead Acid, AGM, Gel
Neutral-Ground Bond Switching	Yes
Chassis	Sealed
Temperature Range	Rated: 0 to 50°C (power derated above 25°C) Maximum*: -25 to 60°C
Warranty	Standard 1 year
Weight (lb/kg)	Unit: 62 / 29 Shipping: 67 / 31
Dimensions H x W x L (in/cm)	Unit: 12 x 8.25 x 16.25 / 33 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56

When “Built Like a Tank” Means More Than a Cliché

M-113 Armored Personnel Carrier, Various United States and International Military Applications

According to the Army, the M-113 “helped to revolutionize mobile military operations” as a fighting platform. That’s an understatement. The M-113 can do everything: launch missiles or mortar shells at ground targets and fire a Vulcan M741 20-mm cannon at air targets, transport soldiers in combat, serve as a field command post, and either roll, swim or get air-dropped to anyplace it needs to be.

As might be expected, the instrumentation, navigation, surveillance, computing and communications electronics on-board such a military marvel are mission-critical, and demand an on-board power source that’s actually build better than the tank on which it’s riding. That’s why **OutBack OBX Extreme Series inverter/chargers serve with not just the M-113, but also the United States Marine Corps’ MRAP Cougar, the United Kingdom’s Panther, and a host of other modern fighting vehicles.**



Note: All OBX models meet clauses related to DC transients for wheeled and tracked profiles in MIL-STD-1275D.

*Functions, but does not necessarily meet all component specifications.



GFX International Series

Limited Power Specialized Application 60Hz/120V Sealed Inverter/Chargers



The OutBack true sine wave GFX International Series inverter/charger is a competitive power solution designed for applications with lower power demands. Incorporating a DC to AC sinewave inverter, battery charger and AC transfer relay housed within a die-cast aluminum chassis, the GFX International Series inverter/charger gives you the ability to sell solar, wind or hydro power back to the utility grid while providing instantaneous backup power in the event of a utility outage.

The GFX International Series' built-in transfer relay automatically disconnects your loads from the utility grid and powers them from the inverter in the event of an outage, allowing you to continue using your solar and battery backup power (unlike traditional grid-tied systems). For areas that frequently experience power instability such as surges, spikes or brownouts, or where standard inverters have trouble syncing to the utility grid, the GFX International Series grid reconnect timers have been shortened to reduce overall sell-back downtime and improve system functionality

Product Highlights:

- For Grid-Tied, Backup or Standalone Power Applications
- True Sinewave Output
- Intelligent Battery Charging with Generator Support
- Sealed Chassis for Harsh Environments

Models*:	GFX1312	GFX1424	GFX1548
Nominal DC Input Voltage	12VDC	24VDC	48VDC
Continuous Power Rating (@ 25°C)	1300VA	1400VA	1500VA
AC Frequency/Voltage	60Hz / 120VAC	60Hz / 120VAC	60Hz / 120VAC
Continuous AC RMS Output (@ 25°C)	10.83AAC	11.66AAC	12.5AAC
Idle Power	Full: ~18W Search: ~6W	Full: ~18W Search: ~6W	Full: ~18W Search: ~6W
Typical Efficiency	90%	92%	93%
Total Harmonic Distortion	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%
Output Voltage Regulation	±2%	±2%	±2%
Maximum Output Current	Peak: 56AAC RMS: 40AAC	Peak: 56AAC RMS: 40AAC	Peak: 56AAC RMS: 40AAC
AC Overload Capacity	Surge: 4600VA 5 Sec: 2900VA 30 Min: 1800VA	Surge: 4600VA 5 Sec: 2900VA 30 Min: 2000VA	Surge: 4600VA 5 Sec: 2900VA 30 Min: 2000VA
AC Input Current Maximum	60AAC	60AAC	60AAC
AC Input Voltage Range (Adjustable)	70 to 140VAC	70 to 140VAC	70 to 140VAC
AC Input Frequency Range	54 to 66Hz	54 to 66Hz	54 to 66Hz
DC Input Voltage Range	10.5 to 17VDC	21 to 34VDC	42 to 68VDC
Continuous Battery Charger Output	70ADC	40ADC	20ADC
Maximum DC Current at Rated Power	130ADC	70ADC	37.5ADC
Temperature Range	Rated: 0 to 50°C (power derated above 25°C) Maximum**: -25 to 60°C	Rated: 0 to 50°C (power derated above 25°C) Maximum**: -25 to 60°C	Rated: 0 to 50°C (power derated above 25°C) Maximum**: -25 to 60°C
Warranty	Standard 5 year	Standard 5 year	Standard 5 year
Weight (lb/kg)	Unit: 49.6 / 22.5 Shipping: 56.4 / 25.6	Unit: 49.6 / 22.5 Shipping: 56.4 / 25.6	Unit: 49.6 / 22.5 Shipping: 56.4 / 25.6
Dimensions H x W x L (in/cm)	Unit: 12 x 8.25 x 16.25 / 33 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56	Unit: 12 x 8.25 x 16.25 / 33 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56	Unit: 12 x 8.25 x 16.25 / 33 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56

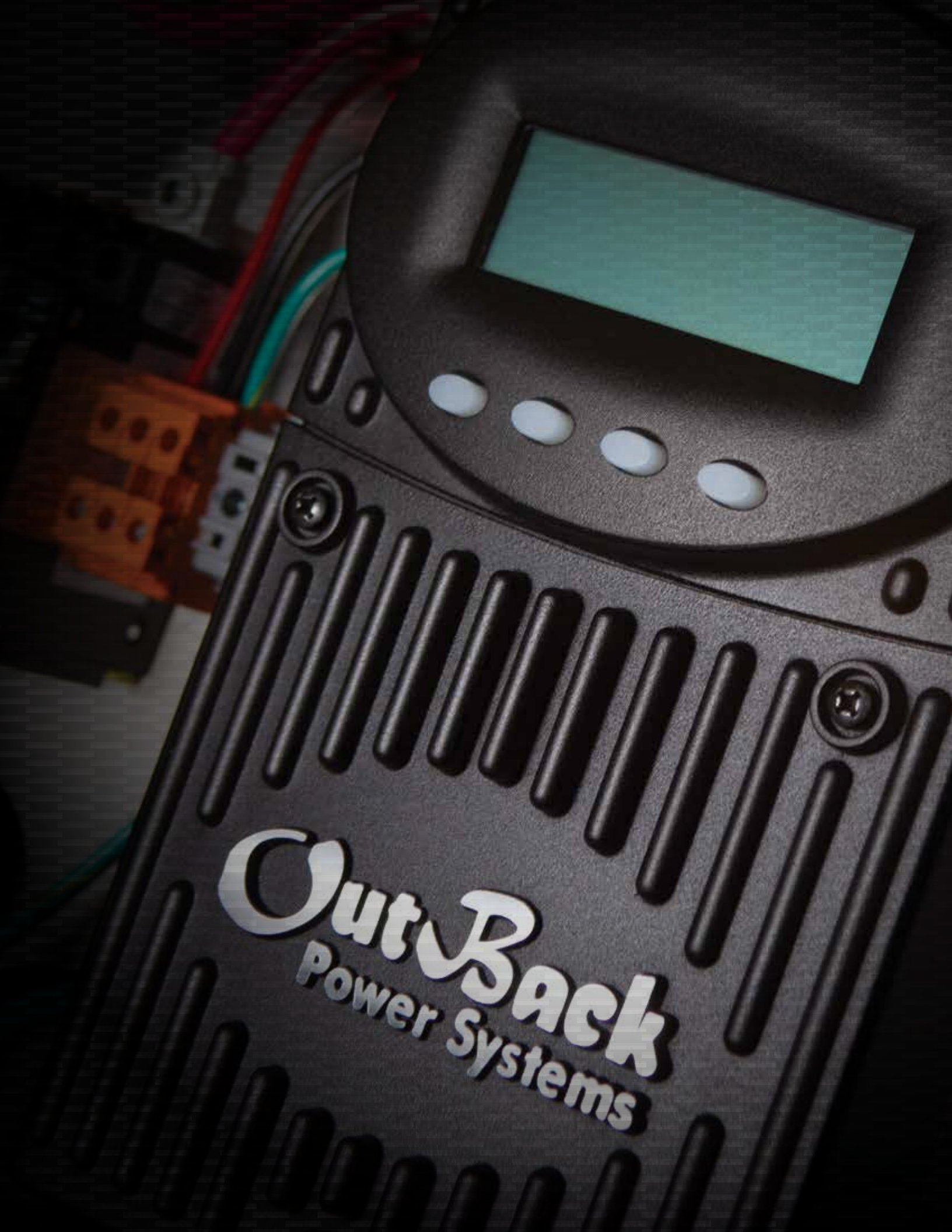


GFX International Series

Limited Power Specialized Application 50Hz/230V Sealed Inverter/Chargers

Models:	GFX1312E	GFX1424E	GFX1448E
Nominal DC Input Voltage	12VDC	24VDC	48VDC
Continuous Power Rating (@ 25°C)	1300VA	1400VA	1400VA
AC Frequency/Voltage	50Hz / 230VAC	50Hz / 230VAC	50Hz / 230VAC
Continuous AC RMS Output (@ 25°C)	5.65AAC	6.09AAC	6.09AAC
Idle Power	Full: ~18W Search: ~6W	Full: ~18W Search: ~6W	Full: ~18W Search: ~6W
Typical Efficiency	90%	92%	93%
Total Harmonic Distortion	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%	Typical: 2% Maximum: 5%
Output Voltage Regulation	±2%	±2%	±2%
Maximum Output Current	Peak: 28AAC RMS: 20AAC	Peak: 28AAC RMS: 20AAC	Peak: 28AAC RMS: 20AAC
AC Overload Capacity	Surge: 4600VA 5 Sec: 2900VA 30 Min: 1800VA	Surge: 4600VA 5 Sec: 2900VA 30 Min: 2000VA	Surge: 4600VA 5 Sec: 2900VA 30 Min: 2000VA
AC Input Current Maximum	30AAC	30AAC	30AAC
AC Input Voltage Range (Adjustable)	140 to 280VAC	140 to 280VAC	140 to 280VAC
AC Input Frequency Range	45 to 55Hz	45 to 55Hz	45 to 55Hz
Grid-Interactive Frequency Range (Default)	48 to 52Hz	48 to 52Hz	48 to 52Hz
Grid-Interactive Voltage Range (Default)	208 to 252VAC	208 to 252VAC	208 to 252VAC
DC Input Voltage Range	10.5 to 17VDC	21 to 34VDC	42 to 68VDC
Continuous Battery Charger Output	70ADC	40ADC	20ADC
Maximum DC Current at Rated Power	130ADC	70ADC	35ADC
Temperature Range	Rated: 0 to 50°C (power derated above 25°C) Maximum*: -25 to 60°C	Rated: 0 to 50°C (power derated above 25°C) Maximum*: -25 to 60°C	Rated: 0 to 50°C (power derated above 25°C) Maximum*: -25 to 60°C
Warranty	Standard 5 year	Standard 5 year	Standard 5 year
Weight (lb/kg)	Unit: 49.6 / 22.5 Shipping: 56.4 / 25.6	Unit: 49.6 / 22.5 Shipping: 56.4 / 25.6	Unit: 49.6 / 22.5 Shipping: 56.4 / 25.6
Dimensions H x W x L (in/cm)	Unit: 12 x 8.25 x 16.25 / 33 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56	Unit: 12 x 8.25 x 16.25 / 33 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56	Unit: 12 x 8.25 x 16.25 / 33 x 21 x 41 Shipping: 21.75 x 13 x 22 / 55 x 33 x 56

*Functions, but does not necessarily meet all component specifications.



OutBack
Power Systems

CHARGE CONTROLLERS

FLEXmax Series

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FLEXmax™ Series

Charge Controllers



FLEXmax 80

FLEXmax 60

The FLEXmax family of charge controllers is the latest innovation in Maximum Power Point Tracking (MPPT) charge controllers from OutBack Power. The innovative FLEXmax MPPT software algorithm is both continuous and active, increasing your photovoltaic array power yield up to 30% compared to non-MPPT controllers. Thanks to active cooling and intelligent thermal management cooling, both FLEXmax charge controllers can operate at their full maximum current rating, 60A or 80A respectively, in ambient temperatures as high as 104°F (40°C).

Included in all of the FLEXmax charge controllers are the revolutionary features first developed by OutBack Power, including support for a wide-range of nominal battery voltages and the ability to step-down a higher voltage solar array to recharge a lower voltage battery bank. A built-in, backlit 80 character display shows the current status and logged system performance data for the last 128 days at the touch of a button.

The integrated OutBack network communications allows FLEXmax Series charge controllers to be remotely programmed and monitored via a MATE system display and provides unrivaled complete system integration.

Product Highlights:

- 60A and 80A Models Available
- Active Cooling for Extreme Temperatures
- Wide Input Voltage Range

Keeping the Power On While Hell Freezes Over

NASA Antarctic Impulse Transient Antenna Array, 37 Kilometers/23 Miles Above the South Pole

On-going radio missions to detect ultra-high energy cosmic-ray neutrinos at the edge of space rely on advanced radio telescopes riding on research balloons, and it's one wild ride—when these upper-atmosphere probes reach maximum altitude, they're pulled into what's known as the "polar vortex" on a circular path high above the Antarctic plateau.

The solar-powered instrumentation payload carried on these scientific missions presents a special challenge in power management. Not only must it operate in extremely low atmospheric temperatures, but it also rotates in and out of direct sunlight high above the ozone layer as it travels. Coping with these variables isn't a job for an ordinary solar charge controller, which is why **NASA uses a specially-modified OutBack FLEXmax 60 to go along on every ANITA mission ride to ensure the optimum on-board power management essential to a successful mission.**





FLEXmax™ Series

Charge Controllers

Models*:	FLEXmax 80 (FM80-150VDC)	FLEXmax 60 (FM60-150VDC)
Nominal Battery Voltages	12, 24, 36, 48, or 60VDC (Single model, selectable via field programming at start-up)	12, 24, 36, 48, or 60VDC (Single model, selectable via field programming at start-up)
Maximum Output Current	80A @ 104°F (40°C) with adjustable current limit	60A @ 104°F (40°C) with adjustable current limit
NEC Recommended Solar Maximum Array STC Nameplate	12VDC systems: 1000W / 24VDC systems: 2000W 48VDC systems: 4000W / 60VDC systems: 5000W	12VDC systems: 750W / 24VDC systems: 1500W 48VDC systems: 3000W / 60VDC systems: 3750W
PV Open Circuit Voltage (VOC)	150VDC absolute maximum coldest conditions / 145VDC start-up and operating maximum	150VDC absolute maximum coldest conditions / 145VDC start-up and operating maximum
Standby Power Consumption	Less than 1W typical	Less than 1W typical
Power Conversion Efficiency	97.5% @ 80ADC in a 48VDC System (typical)	98.1% @ 60ADC in a 48VDC System (typical)
Peak Efficiency	60VDC input w/48V battery at 53.1VDC (98.44%)	68VDC input w/48V battery at 52.8VDC (98.31%)
Charging Regulation	Bulk, absorption, float, silent and equalization	Bulk, absorption, float, silent and equalization
Voltage Regulation Set points	13 to 80VDC user adjustable with password protection	13 to 80VDC user adjustable with password protection
Equalization Charging	Programmable voltage setpoint and duration, automatic termination when completed	Programmable voltage setpoint and duration, automatic termination when completed
Battery Temperature Compensation	Automatic with optional RTS installed / 5.0mV per °C per 2V battery cell	Automatic with optional RTS installed / 5.0mV per °C per 2V battery cell
Voltage Step-Down Capability	Down convert from any acceptable array voltage to any battery voltage. Example: 72VDC array to 24VDC battery; 60VDC array to 48VDC battery	
Programmable Auxiliary Control Output	12VDC output signal which can be programmed for different control applications (maximum of 0.2ADC)	
Status Display	3.1" (8 cm) backlit LCD screen, 4 lines with 80 alphanumeric characters total	3.1" (8 cm) backlit LCD screen, 4 lines with 80 alphanumeric characters total
Remote Display and Controller	Optional MATE3, MATE or MATE2	Optional MATE3, MATE or MATE2
Network Cabling	Proprietary network system using RJ-45 modular connectors with CAT5 cable (8 wires)	Proprietary network system using RJ-45 modular connectors with CAT5 cable (8 wires)
Data Logging	Last 128 days of operation: amp-hours, watt-hours, time in float, peak watts, amps, solar array voltage, max. battery voltage, min. battery voltage and absorb time, accumulated amp-hours, and kWh of production	
Operating Temperature Range	-40 to 60°C (power automatically derated above 40°C)	-40 to 60°C (power automatically derated above 40°C)
Environmental Rating	Indoor Type 1	Indoor Type 1
Conduit Knockouts	One 1" (25.4mm) on the back; One 1" (25.4mm) on the left side; Two 1" (25.4mm) on the bottom	One 1" (25.4mm) on the back; One 1" (25.4mm) on the left side; Two 1" (25.4mm) on the bottom
Warranty	Standard 5-year / Available 10-year	Standard 5-year / Available 10-year
Weight (lb/kg)	Unit: 12.20 / 5.53 Shipping: 15.5 / 7	Unit: 11.65 / 5.3 Shipping: 14.9 / 6.8
Dimensions H x W x D (in/cm)	Unit: 16.25 x 5.75 x 4.5 / 41.3 x 14.6 x 11.4 Shipping: 19 x 9.5 x 8.5 / 48.3 x 24.1 x 21.6	Unit: 13.75 x 5.75 x 4.5 / 35 x 14.6 x 11.4 Shipping: 17 x 9.5 x 8.5 / 43.2 x 24.1 x 21.6
Options	Remote Temperature Sensor (RTS), HUB4, HUB10, MATE, MATE2, MATE3	Remote Temperature Sensor (RTS), HUB4, HUB10, MATE, MATE2, MATE3
Menu Languages	English & Spanish	English & Spanish
Certifications	ETL Listed to UL1741, CSA C22.2 No. 107.1	ETL Listed to UL1741, CSA C22.2 No. 107.1

*Use appropriate wire size in accordance with NEC.



FLEXmax™ Extreme

Charge Controller



The OutBack FLEXmax Extreme: A sealed, outdoor-rated charge controller with unprecedented thermal management capabilities designed for the most extreme environmental conditions.

The FLEXmax Extreme is engineered around the concept that the strongest chain is one with no weak links. In the case of charge controller design, the weak link is typically the cooling fan. Removing the fan removes the greatest obstacle to long service life and high reliability, as fan problems severely limit power output.

Because the FLEXmax Extreme's passively cooled unit can be sealed, circuit boards and other sensitive electronics can be fully protected from dust, dirt, insects, and other external sources of contamination.

Installer features of the FLEXmax Extreme include "ground agnostic" design to support negative, positive and floating ground systems, increased wire-bending space, oversized terminals for easier installation and mechanical design that permits servicing and replacing all power components while the unit is mounted on a wall and attached to conduit.

The FLEXmax Extreme charge controller is a fitting companion to OutBack's renowned sealed FX inverter/charger line and demonstrates the company's ongoing commitment to providing clean, reliable power anywhere it has the potential to transform lives.

Product Highlights:

- Environmentally-Rated Sealed Enclosure
- Solid-State, Passively Cooled Design
- Multi-Voltage Maximum Power Point Tracking

Building Geo-Political Stability with Renewable Energy

Solar/Wind Hybrid Power Generators, Central Asia, North Africa and Other Regions

As a European Union member enjoying unprecedented economic growth, Turkey's expansion into renewable energy is opening a new export opportunity: system integration. Istanbul Energy is an example, with its Triac solar and wind hybrid power stations which are an extremely cost-effective alternative to the diesel generators on which many users in neighboring developing regions rely.

Ironically, early adopters of these renewable energy systems include the fossil-fuel business, in the form of oil and gas extraction outfits in Turkmenistan and other resource-rich areas. Triacs are being deployed in their production fields to ensure an uninterrupted supply of essential fuels for European markets concerned about stability in the Ukraine and consequently highly interested in alternative production and pipeline sources. As **Istanbul Energy's CEO Serdar Yerdelen** explains, **"our aim was to produce and sell plug-and-play-systems for remote areas where sending technicians and engineers will be very difficult and expensive. We use OutBack products in our systems because of their solidity, practicality of installation, and ease of use."**





FLEXmax™ Extreme

Charge Controller

Model:	FLEXmax Extreme
Nominal DC Input Voltage	12, 24, 36, 48 or 60VDC (Automatic adjustment at start-up)
Maximum Output Current	80A @ 45°C / 113°F with adjustable current limit
PV Open Circuit Voltage (VOC)	150VDC absolute maximum coldest conditions / 145VDC start-up and operating maximum
NEC Recommended Maximum (Solar Array STC Nameplate)	12VDC systems: 1000W 24VDC systems: 2000W 48VDC systems: 4000W 60VDC systems: 5000W
Standby Power Consumption	Less than 1W typical
Charging Regulation	Bulk, absorption, float, silent and equalization
Typical Power Conversion Efficiency	98% @ 60ADC in a 48VDC system
Equalization Charging	Programmable voltage setpoint and duration, automatic termination when complete
Remote Battery Voltage Sense	Yes
Voltage Regulation Setpoints	13 to 80VDC
Battery Temperature Compensation	Automatic with optional RTS installed
Battery Temperature Compensation Slope	Adjustable 2.0 to 6.0mV per °C per 2V battery cell (5mV default)
Equalization Charging	Programmable voltage setpoint and duration—automatic termination when completed
Voltage Step-Down Capability	Down convert from any acceptable array voltage to any battery voltage. Examples: 72VDC array to 24VDC battery; 60VDC array to 48VDC battery
Programmable Auxiliary Control Output	12VDC output signal which can be programmed for different control applications (maximum of 0.25ADC)
Remote Display and Controller	Optional MATE3 or AXS Port
Data Logging	Last 128 days of operation: amp-hours, watt-hours, time in float, peak watts, amps, solar array voltage, max. battery voltage, min. battery voltage and absorb time, accumulated amp-hours, and kWh of production
Positive Ground Application	Requires dual-pole circuit breaker for switching both positive and negative conductors on PV input
Operating Temperature Range	-40 to 60°C (Full power output -20 to 45°C with passive cooling, -20 to 55°C with Turbo Fan option)
Environmental Rating	IP54 / NEMA 3R
Conduit Knockouts	One 1" trade size (25.4mm) on both left and right sides; one on the back; two on the bottom
Warranty	Standard 5 year / available 10 year
Weight (lb/kg)	Unit: 22.6 / 10.23 Shipping: 26.0 / 11.79
Dimensions H x W x D (in/cm)	Unit: 18.56 x 8.8 x 6.0 / 47.1 x 22.4 x 15.2 Shipping: 9.69 x 11.75 x 22.75 / 24.6 x 29.8 x 57.8
Non-Volatile Memory	Yes
Field Upgradable Firmware	Yes
Certifications	UL1741, CSA C22.2 No. 107.1, EN 50178, AS/NZS 3100, EN 61000-6-1, EN 61000-6-3, EN 55022, FCC Class B, RoHS, CE
Optional Accessories	AXS Port: OutBack Modbus/TCP Interface card for remote system communication and control using Modbus over Ethernet (card only, for FLEXmax Extreme only) FLEXmax Extreme Fan: External fan kit RTS: Remote Temperature Sensor



State of Charge

OutBack POWER

www.outbackpower.com

FLEXnet DC

Serial Number

FX3048

Power Only Inverter

Waveform Changer

AC Transfer Switch

BAT-
BAT+

RELAY
RELAY

C DEVICE SIDE
C BAT+ SIDE

B DEVICE SIDE
B BAT+ SIDE

A DEVICE SIDE
A BAT+ SIDE

PNDC10112

BATTERY STATUS

INVERTER

CHARGER

GEN

COMMUNICATIONS

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OPTICS RE

Web-Based System Monitoring and Control Platform

It's a powerful advantage...the ability to see the electricity you produce and consume.

To monitor and control your renewable energy system with the touch of a button from any internet connected device—anywhere in the world. Real-time status and hands-on control of your power flow and energy storage. Track individual system performance or manage a network of dispersed systems. OPTICS RE from OutBack Power.

Product Highlights:

- Accessible From Any Internet-Connected Device
- Simple, Intuitive User Interface
- Can Be Configured to Meet Needs of Individual Users
- Real-Time Energy Use Data Helps to Save Money



OutBack OPTICS RE Features:



See your energy use and production



Access your system from any internet connected device



Remote control access of your system



Easily verify system performance and health



Smart grid ready



Simple insight into complex data via historical graphs



Notifications and alerts sent via email



Protect your solar energy investment



Save up to 30% on energy bills



Stay connected with your green lifestyle



MATE3

Advanced System Display and Communications



OPTICS RE Compatible

The MATE3 advanced system display and communications make it easier than ever to program and monitor a complete OutBack Power system. An intuitive user interface and integrated system configuration wizard make system setup and programming quick and seamless. The ability to set unique multi-level user passwords makes it possible to secure critical system settings from unintended changes while still allowing open access to necessary functions.

Other features making system management simpler include an easy-to-read graphical backlit LCD display, improved tactile buttons, and user programmable “favorite” keys for immediate access to the most wanted features. An intuitive scroll wheel interface allows easy adjustment of system set points. Expandable SD card memory increases data-logging capacity as well as making it easy to upgrade units in the field.

A built-in clock and calendar function enables timer-based programming of inverter and charger operation. This setting allows the system to work with time-of-day power rates or to limit a generator’s runtime to a specific time period of the day or week. All settings are stored in onboard memory to eliminate the need to reprogram in the event of a system shutdown or battery replacement. The MATE3 supports web-server access via an intranet to allow monitoring of an OutBack system.

Product Highlights:

- Program, Manage and Monitor Entire System
- Intuitive Menu Structure with Easy-to-Read Graphical Display
- System Configuration Wizard
- Up to One Year of Data Logging

Model:	MATE3
Display	4.0 x 1.2" full graphical display
Quick System Access	5 system operation hot keys, 4 user programmable soft keys
Status Indicators	(9) LED indicators
Navigational Controls	5 navigational keys
Setpoint Adjustment	Touch sensitive scroll wheel
Communication Protocol	Proprietary OutBack communications protocol
Interconnect Cabling Included	Standard CAT5 network cable with RJ-45 modular jack - 6' (2m) included
PC Computer Interface	HTML system status dashboard over local intranet connection
Field Update Capability	Yes (includes Radian Series inverter/chargers, FLEXmax Series charge controllers [rev 3.0 or higher] and FLEXmax Extreme charge controller)
Microprocessor	80MHz 32 bit processor
Set Point and Data Memory	8Mb RAM/ 64Mb of flash RAM
Clock/Calendar	On-board real time clock with battery backup
Operating Temperature Range	0 to 50°C
Mounting	Surface-mount (various brackets available)
Environmental Rating	Indoor Type 1 (IP 30)
Maximum Cable Length	300' (100m)
Optional Accessories	MATE3 USB card
Warranty	Standard 5 year Warranty
Weight (lb/kg)	Unit: 1.4 / 0.64 Shipping: 3.0 / 1.36
Dimensions H x W x D (in/cm)	Unit: 7.1 x 7.5 x 1.6 / 18 x 19 x 4.1 Shipping: 3.25 x 9 x 13.5 / 8.26 x 22.9 x 34.3



MATE & MATE2

System Display and Communications



MATE



MATE2

The MATE system display and communication devices are complete management tools for your OutBack Power system. Through the use of a single MATE or MATE2, you can remotely manage and monitor multiple inverter/chargers, FLEXmax charge controllers and any future OutBack Power conversion or control product.

The MATE and MATE2 are packed full of features to make system management simple. The easy-to-read 3.1" (8 cm) LCD is backlit for dark operating conditions. Four soft keys allow easy context-based navigation of menus and functions. Two hot keys give immediate access to AC and inverter functions.

A built-in clock and calendar function enables timer based programming of inverter and charger operation, allowing operators to set the system to work with time-of-day power rates or to limit a generator's runtime to a specific time period of the day or week. All of your settings are stored in permanent memory to eliminate the need to reprogram in the event of a system shutdown or battery replacement. The MATE and MATE2 include a RS232 port with DB9 jack for connection to the serial port of a PC computer. Through the use of optional WinVerter software, operators can perform actions such as data-logging and graphical display of the system's operation and performance. The MATE system display and controller is surface mounted while the MATE2 is flush mountable in a wall cut-out.

Product Highlights:

- Simple System Management
- Four Soft Keys Allow Easy Context-Based Navigation of Menus and Functions
- Built-In Clock and Calendar Function
- Two Hot Keys Give Immediate Access to AC and Inverter Functions

Models: MATE & MATE2

Product Color/Mount	MATE: Gray or black, surface-mount MATE2: Black, flush-mount
Interface Display	3.1" (8 cm) backlit LCD including 2 four line, 80 alpha numeric characters
Control Keypad	6 backlit silicone keys, dedicated inverter and AC input keys
Status Indicators	Two LED Status Indicators: AC input (yellow), inverting (green)
Communication Protocol	Proprietary OutBack multi-drop using an OutBack HUB4 or HUB10
Interconnection Cabling	Standard CAT5 network cable with RJ-45 modular jack, 10' (5m) included
PC Computer Interface	RS232 opto-isolated DB9 jack 9600 baud serial communication
Microprocessor	16MHz low power consumption
Set Point and Data Memory	32k non-volatile flash RAM
Clock/Calendar	On-board real time clock with battery backup
Operating Temperature Range	0 to 50°C
Environmental Rating	Indoor Type 1 (IP 30)
Maximum Cable Length	1000' (300m)
Warranty	Standard 5 year
Shipping Weight (lb/kg)	1 / 0.5
Shipping Dimensions H x W x L (in/cm)	4.25 x 5.75 x 2 / 11 x 15 x 5



AXS Port

Modbus Transmission Control Protocol (TCP) Interface



The AXS Port Modbus TCP, now OPTICS RE compatible, is a powerful and economical tool that allows installers and system owners the ability to monitor and control system status from any location. When paired with OPTICS RE, the AXS Port interface offers advanced system monitoring and control features including:

- Real-Time PV/Solar System Performance Monitoring via Intuitive Dashboard Interface From any Internet-Connected Device
- Efficient Management of Multiple OutBack Power System Installations Under One Account
- Remote Troubleshooting
- Reduced Onsite Service Calls and System Downtime

The AXS Port makes it possible to create custom user interfaces for systems using the advanced API program development kit* and download system data logs using Modbus-read or FTP transfer. All user-configurable values are backed up with non-volatile memory, ensuring stable performance and system recovery. An optional remote temperature-sensing function provides a simple, low-cost tool for capturing and reporting ambient temperature or other critical thermal information records.

The AXS Port is a SunSpec compliant device**, which means it speaks the renewable energy industry's common language used to drive data and interoperability standards for plug-and-play operation between components and management systems.

Product Highlights:

- Remote System Control and Monitoring via Web Interface with OPTICS RE
- SunSpec-Compliant Device for Interoperability and Plug-and-Play Operation
- Over Two Years of Data Logging
- Firmware Upgradable Over an Ethernet Network
- Accessories Include MicroSD Memory and DIN-Rail Mounting Clip

Model:	AXS Port
Power	Supplied by OutBack device
Status Indicators	Seven LED indicators
Clock	On-board real-time clock with battery backup
Internet Standards	TCP/IP, DNS, SMTP, FTP, DHCP, NTP
Ports	HUB10.3/Device: RJ-45 Communications: RJ-45 Temperature Sensor: RJ-11
Communication Protocol	Modbus TCP to the SunSpec standard
OutBack Device Interface	OutBack proprietary
PC Interface	10/100 Ethernet
Mounting	DIN clip (provided) or surface mounting
Environmental Rating	Indoor Type 1 (IP 30) non-condensing
Temperature Ranges	AXS Port: -40 to 75°C SD Card: -25 to 75°C
Weight (lb/kg)	Unit: 0.5 / 0.23 Shipping: 2.1 / 0.95
Dimensions H x W x D (in/cm)	Unit: 1.29 x 3.5 x 4.99 / 3.3 x 8.9 x 12.7 Shipping: 3.25 x 9 x 13.5 / 8.3 x 22.9 x 34.3
SD Card Size	MicroSD Type 2 (2 GB capacity)
Options	OutBack RTS
Certifications	FCC Part 15, subpart B CE, RoHS, SunSpec

*Download the API development kit at www.outbackpower.com **SunSpec client software is required for operation. Visit www.sunspec.org for more information.



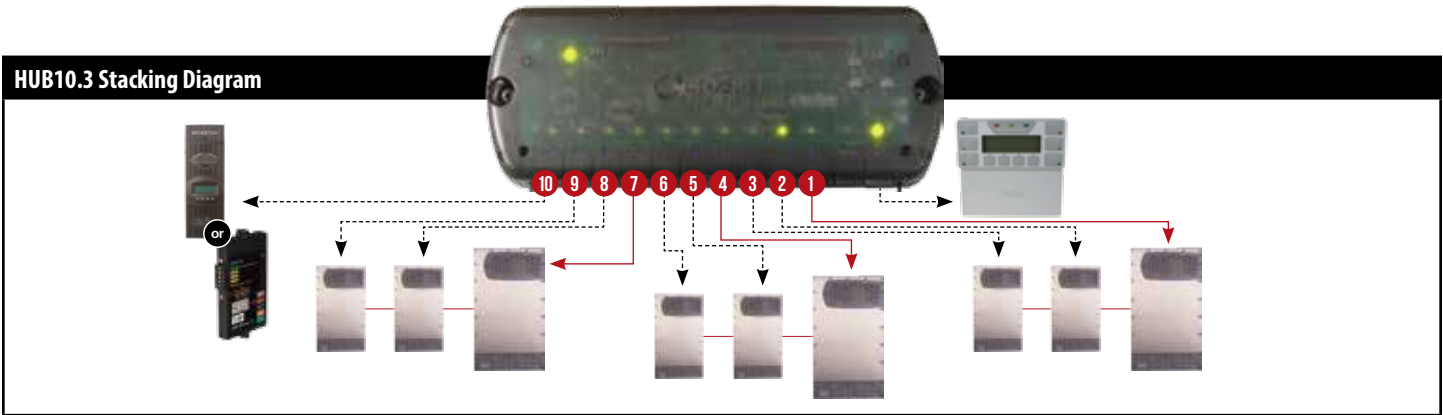
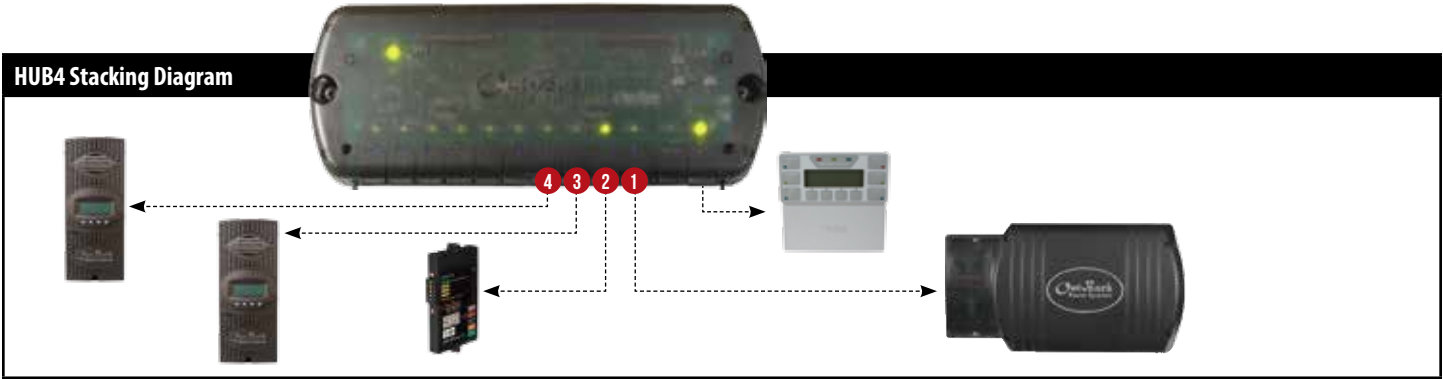
HUB4 & HUB10.3

System Communications Manager

HUB System Communications Manager

The HUB system communications manager components form the backbone of a networked OutBack power conversion system. The OutBack HUB communicates stacking, load share and power save off/on signals. Interconnection cabling is standard Ethernet CAT5 with RJ-45 modular jacks. Through a HUB, a system is completely coordinated and managed by the MATE advanced system display and communications.

Models:	HUB4	HUB10.3
Number of Ports	4 plus MATE	10 plus MATE
Operating Temperature Range	0 to 50°C	0 to 50°C
Three-phase/Sub-Phase Master Stacking	No	Yes
Warranty	Standard 5 year	Standard 5 year
Weight (lb/kg)	Unit: 1 / 0.5 Shipping: 3 / 1.4	Unit: 1 / 0.5 Shipping: 3 / 1.4
Dimensions H x W x L (in/cm)	Unit: 10.5 x 6.25 x 1.27 / 27 x 16 x 3 Shipping: 12 x 6 x 5 / 31 x 15 x 13	Unit: 10.5 x 6.25 x 1.27 / 27 x 16 x 3 Shipping: 12 x 6 x 5 / 31 x 15 x 13





FLEXnet™ DC

DC System Monitoring Device

FLEXnet DC

The OutBack FLEXnet DC is the ultimate DC System monitoring device. Integrated networked communications capability makes valuable, usable data available from a system viewable on an OutBack MATE communications device (screens shown below), providing information on system health, performance and efficiency. FLEXnet DC provides real state-of-charge (S.O.C.) information about the life and state of a battery bank.



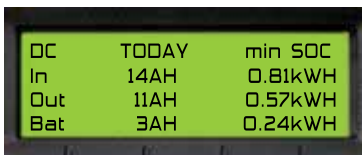
Battery Status Screen

Easily see a system's current condition with this at-a-glance display. This screen shows an easy-to-interpret "fuel gauge" style status bar, current state of charge and whether batteries are currently charging or discharging. Useful for system owners who want a way to quickly understand the current state of their battery bank.



Now Summary Screen

Monitor the amount of power a system is currently producing and consuming as well as the amount of power going IN and OUT of a battery bank. This screen also displays battery bank voltage and current state of charge, providing real-time production monitoring of DC sources such as a solar array or small wind turbine, as well as consumption by loads.



Today Summary Screen

Monitor the cumulative energy a system has produced and consumed as well as the total amount of energy that has gone into daily battery charging. This screen also displays the day's lowest state of charge and allows viewing of how overall system production compares to system consumption.



History Summary Screen

Review historical energy production/consumption data for the most recent 128 days, including the minimum battery state of charge reached for each day. Useful for monitoring power system production and consumption trends.

Model: FLEXnet DC

Battery Voltage	Input range: 8.0 to 80.0VDC Resolution: 0.1VDC
Number of Current Channels	One to three (each can be a source or load)
Current	Range (each channel): -1000.0 +1000.0ADC Resolution: 0.1ADC
State of Charge Display	0 to 100% (1% increments)
Aux Relay Configuration	SPST, magnetic latching relay
Aux Relay Maximum Rating	5A @ 30VDC
Current Shunt Type (Order Separately)	500A / 50mV
Display	Primary: MATE, MATE2 or MATE3 Secondary: Five LED Indicators on front of FLEXnet DC
Battery Ah Capacity Range	100 to 10,000Ah
Data Logging Memory	Most recent 128 days
Programmable AUX Relay Settings	Battery Volts: Adjustable from 8.0 to 80.0VDC State of Charge: Adjustable from 0 to 100% Time Delay: Adjustable from 0 to 240 Minutes
Accuracy	0.5% of reading +/- 2 LSDs per channel
Operating Temperature Range	0 to 50°C (32 to 122°F)
Mounting	3/4" Panel mount breaker slot or surface mount using built-in mounting bars
Warranty	Standard 5 year
Weight (lb/kg)	Unit: 0.31 / 0.14 Shipping: 2 / .91
Dimensions H x W x L (in/cm)	Unit: 0.7 x 3.7 x 5.5 / 1.8 x 9.4 x 14 Shipping: 2.1 x 9.0 x 11.5 / 5.3 x 22.9 x 29.2



INTEGRATED SYSTEMS

Fully Pre-Wired Systems

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FLEXpower™ ONE

Fully Pre-Wired Single Inverter System*



The FLEXpower ONE accommodates all of the essential protective devices in the smallest possible space at the lowest installed cost, making it ideal for applications with modest power requirements such as cabins, chalets, homes, remote communication sites and backup power systems.

Utilizing an extremely compact design and an easy-to-install mounting bracket, the fully pre-wired and factory tested FLEXpower ONE System is designed for quick installation, saving both time and money. System components carry all of the necessary ETL certifications allowing for a code compliant installation that looks great. The OutBack Power FLEXpower ONE is the only choice when you need a fully integrated, true sine wave, reliable power system.

Product Highlights:

- Accommodates all Essential Protective Devices in an Extremely Compact Space
- Ideal for Applications with Modest Power Requirements
- Designed for Quick Installation
- AC and DC Wiring Boxes



OPTICS RE Compatible

For 120VAC/60Hz Applications

	Description	Inverter(s)	FW-X240	Bypass	Outlet	Inverter OCPD**	PV OCPD**	RTS
FP1 VFX3524	VFX3524 3.5kW FLEXpower ONE	VFX3524	—	120VAC Bypass	NEMA 5-15	250A	80A	Yes
FP1 VFX3648	VFX3648 3.6kW FLEXpower ONE	VFX3648	—	120VAC Bypass	NEMA 5-15	175A	80A	Yes
FP1 GVFX3524	GVFX3524 3.5kW FLEXpower ONE	GVFX3524	—	120VAC Bypass	NEMA 5-15	250A	80A	Yes
FP1 GVFX3648	GVFX3648 3.6kW FLEXpower ONE	GVFX3648	—	120VAC Bypass	NEMA 5-15	175A	80A	Yes
FP1 GTFX3048	GTFX3048 3kW FLEXpower ONE	GTFX3048	—	120VAC Bypass	NEMA 5-15	175A	80A	Yes
FP1 FX3048T	FX3048T 3kW FLEXpower ONE	FX3048T	—	120VAC Bypass	NEMA 5-15	175A	80A	Yes
FP1 FX2524T	FX2524T 2.5kW FLEXpower ONE	FX2524T	—	120VAC Bypass	NEMA 5-15	175A	80A	Yes
FP1 GTFX2524-HI	GTFX2524-HI 2.5kW FLEXpower ONE for Hawaii	GTFX2524-HI	—	120VAC Bypass	NEMA 5-15	175A	80A	Yes
FP1 GTFX3048-HI	GTFX3048-HI 3kW FLEXpower ONE for Hawaii	GTFX3048-HI	—	120VAC Bypass	NEMA 5-15	175A	80A	Yes

For 230VAC/50Hz Applications

	Description	Inverter(s)	FW-X240	Bypass	Outlet	Inverter OCPD**	PV OCPD**	RTS
FP1 VFX3024E	VFX3024E 3kW FLEXpower ONE	VFX3024E	—	230VAC Bypass	CEE 7	250A	80A	Yes
FP1 VFX3048E	VFX3048E 3kW FLEXpower ONE	VFX3048E	—	230VAC Bypass	CEE 7	175A	80A	Yes
FP1 GVFX3024E	GVFX3024E 3kW FLEXpower ONE	GVFX3024E	—	230VAC Bypass	CEE 7	250A	80A	Yes
FP1 GVFX3048E	GVFX3048E 3kW FLEXpower ONE	GVFX3048E	—	230VAC Bypass	CEE 7	175A	80A	Yes

Easy Bracket Mounting

FLEXpower systems are designed with ease of installation in mind. The hanging bracket installs quickly, allowing the entire system to be hung with minimal effort.





FLEXpower™ TWO

Fully Pre-Wired Dual Inverter System*



The FLEXpower TWO accommodates all of the essential protective devices in an easy-to-install, fully pre-wired and factory tested dual inverter system. The FLEXpower TWO is ideal for applications with medium sized power requirements such as homes, light commercial or larger backup power systems. Utilizing a compact design and an easy-to-install mounting plate, the FLEXpower TWO System can be mounted in either a horizontal or vertical orientation to allow quick installation in more space-limited locations, saving both time and money.



OPTICS RE Compatible

Product Highlights:

- Equipped with Battery and PV Array Breakers
- Input-Output-Bypass Assembly
- Additional AC Breakers
- Components Carry All Necessary ETL Certifications

For 120/240VAC/60Hz Applications	Description	Inverter(s)	FW-X240	Bypass	Outlet	InverterOCPD**	PV OCPD**	RTS
FP2 VFX3648	Dual VFX3648 7.2kW FLEXpower TWO	VFX3648 (x2)	Yes	240VAC Bypass	N/A	175A	80A	Yes
FP2 VFX3524	Dual VFX3524 7kW FLEXpower TWO	VFX3524 (x2)	Yes	240VAC Bypass	N/A	250A	80A	Yes
FP2 GTFX3048	Dual GTFX3048 6kW FLEXpower TWO	GTFX3048 (x2)	—	240VAC Bypass	N/A	175A	80A	Yes
FP2 GVFX3524	Dual GVFX3524 7kW FLEXpower TWO	GVFX3524 (x2)	—	240VAC Bypass	N/A	250A	80A	Yes
FP2 GVFX3648	Dual GVFX3648 7.2kW FLEXpower TWO	GVFX3648 (x2)	—	240VAC Bypass	N/A	175A	80A	Yes
FP2 FX3048T	Dual FX3048T 6kW FLEXpower TWO	FX3048T (x2)	Yes	240VAC Bypass	N/A	175A	80A	Yes
FP2 FX2524T	Dual FX2524T 5kW FLEXpower TWO	FX2524T (x2)	Yes	240VAC Bypass	N/A	175A	80A	Yes
FP2 GTFX3048-HI	Dual GTFX3048-HI 6kW FLEXpower TWO for Hawaii	GTFX3048-HI (x2)	—	240VAC Bypass	N/A	175A	80A	Yes
FP2 GTFX2524-HI	Dual GTFX2524-HI 6kW FLEXpower TWO for Hawaii	GTFX2524-HI (x2)	—	240VAC Bypass	N/A	175A	80A	Yes

For 230VAC/50Hz Applications	Description	Inverter(s)	FW-X240	Bypass	Outlet	InverterOCPD**	PV OCPD**	RTS
FP2 VFX3048E	Dual VFX3048E 6kW FLEXpower TWO	VFX3048E (x2)	—	230VAC Bypass	N/A	175A	80A	Yes
FP2 VFX3024E	Dual VFX3024E 6kW FLEXpower TWO	VFX3024E (x2)	—	230VAC Bypass	N/A	250A	80A	Yes

When “Next Day Air” is Wishful Thinking

Small Luxury Hotel Chain, Tulum, Mexico

The natural beauty of Mexico’s “Mayan Riviera” is the ideal setting for a small luxury hotel—as long as electrical generation is included in the plans, since the location is miles away from the nearest utility. Experience operating three off-the-grid hotels in the area gave the Colibri Hotel Collection a clear idea of what they wanted in a second-generation electricity solution to replace their original: greater capacity, three-phase operation, and extreme reliability since a hotel can’t afford any “downtime” and replacement parts are at best days away.

Colibri chose OutBack FLEXpower systems with a total of six inverter/chargers to do the job, which is formidable: reducing the run-times of power generators to 4-hour stints in order to save fuel, cut noise and emissions, and reduce generator maintenance. **With an OutBack system in place the resort’s fuel use was cut in half, resulting in over \$25,000 in annual savings on fuel alone.** Colibri Hotel’s head engineer Greg Brown observes “maintaining power off the grid is beyond a full time job. . . OutBack Power’s inverters are incredible units that cut our costs and contribute to a luxurious guest experience.”



*All pre-wired systems include FX/VFX inverter/chargers, FLEXmax 80 charge controllers, MATE3 system display and communications, FLEXnet DC system monitor, AC and DC wiring boxes, HUB 10.3 communications, surge protector and remote temperature sensor. The FP2 is also equipped with battery and PV array breakers, Input-Output-Bypass assembly, additional AC breakers and mounting for MATE3 and charge controllers. Additional configurations available. ** Overcurrent protective device.



FLEXpower™ THREE

Fully Pre-Wired Triple Inverter System* for Off-Grid Applications



OPTICS RE Compatible

OutBack pre-assembled, pre-wired and pre-tested FLEXpower THREE takes the concept of fast, easy installation to a new level of performance, value and flexibility.

The FLEXpower THREE system is designed for 120/208VAC, 60Hz off-grid commercial, backup and three-phase applications with medium sized power requirements. FLEXpower THREE systems are offered in 9kW and 10.8kW configurations.

With a compact design and an easy-to-install mounting plate, OutBack's FLEXpower systems can mount in a horizontal or vertical orientation to allow for proper installation and ventilation in more space-limited locations. Select FLEXpower models are available with a choice of sealed FX inverter/chargers for use in harsh or corrosive environments.

Product Highlights:

- Factory Tested, Pre-Wired and Pre-Configured
- Field-Configurable Settings
- Optimized System Footprint
- AC Cabinet to Use as Distributed Load Panel

For 120/208VAC 60Hz Applications

	Description	Inverter(s)	FW-X240	Bypass	Charge Controller	Inverter OCPD™	PV OCPD**	RTS
FP3 FX3048T	Triple FX3048T 9kW FLEXpower THREE	(3) FX3048T	—	208VAC Bypass	(3) FLEXmax 80	175A	80A	Yes
FP3 VFX3648	Triple VFX3648 10.8kW FLEXpower THREE	(3) VFX3648	—	208VAC Bypass	(3) FLEXmax 80	175A	80A	Yes

The Lion Sleeps Better Tonight

Niassa Reserve Headquarters Electrical System, Mozambique

The size of Massachusetts and Connecticut combined, Niassa National Reserve is home to over 35,000 people in some 40 villages—and also to large populations of elephants, wild dogs, and African lions all under protection from poachers and other dangers. With the goal of helping everyone in the neighborhood get along the Niassa Lion Project's mission is to promote coexistence through communications and education—something easier said than done, since advance scout quarters lacked electricity to power the necessary infrastructure.

Partnering with the Wildlife Conservation Network (WCN), the organization was able to secure PV/solar electricity systems to run Reserve management offices and remote anti-poaching scout camps, and support community outreach and conservation activities. **OutBack based PV/solar systems reliably run computers, satellite internet access, radio communications, lighting, refrigeration and more, something WCN has come to expect.** As technology manager Stephen Gould explains, "OutBack has powered 13 projects with WCN without a single failure or problem. Given OutBack's success in previous projects and in extreme, remote locales, we exclusively use them to provide off-grid solar energy to the conservation project."





FLEXpower™ FOUR

Fully Pre-Wired Quad Inverter System*



OutBack pre-assembled, pre-wired and pre-tested FLEXpower FOUR takes the concept of fast, easy installation to a new level of performance, value and flexibility.

The FLEXpower FOUR System is ideal for 120/240VAC split-phase applications with larger sized power requirements, such as large residential, commercial, or village power systems. FLEXpower FOUR Systems are offered in 12kW and 14.4kW and can be combined with other FLEXpower systems for up to a total of 36kVA.

With a compact design and an easy-to-install mounting plate, OutBack's FLEXpower systems can mount in a horizontal or vertical orientation to allow for proper installation and ventilation in more space-limited locations. Select FLEXpower models are available with a choice of sealed FX inverter/chargers for use in harsh or corrosive environments.

Product Highlights:

- Factory Tested, Pre-Wired and Pre-Configured
- Field-Configurable Settings
- Optimized System Footprint
- AC Cabinet to Use as Distributed Load Panel

For 120/240VAC 60Hz Applications	Description	Inverter(s)	FW-X240	Bypass	Charge Controller	Inverter OCPD™	PV OCPD™	RTS
FP4 FX3048T	Quad FX3048T 12kW FLEXpower FOUR	(4) FX3048T	Yes	240VAC Bypass	(4) FLEXmax 80	175A	80A	Yes
FP4 VFX3648	Quad VFX3648 14.4kW FLEXpower FOUR	(4) VFX3648	Yes	240VAC Bypass	(4) FLEXmax 80	175A	80A	Yes

Making Music Greener

Renewable Energy-Powered Portable Event Stages Used Around the U.S.

Technology and economic efficiencies in renewable energy systems progressed to the point where it is theoretically possible to use them for powering high-powered audio, video and lighting systems used in outdoor concerts and festivals. Alternative Power Productions of California turned theory into practice with their mobile sound stages powered by renewable energy. Proof of their success is a 90+ client list reading like a Who's Who of the music industry, with names including Neil Young, Stevie Wonder and Willie Nelson.

The power-plant is a solar/diesel off-grid powered by a PV array built as big as the stage cover itself, and backed-up with an equally large battery bank below the stage floor. **Delivering ultra-clean, quiet power for such a high-profile, demanding application is an impressive demonstration of renewable energy—with OutBack FLEXpower and FLEXware systems in the middle of it.** Notes Alternative Power Productions' Mark McLarry, "Reliability is key for the success of Alternative Power Productions. That is why we work strictly with OutBack inverters. They're always reliable."



*All pre-wired systems include FX/VFX inverter/chargers, FLEXmax 80 charge controllers, MATE3 system display and communications, FLEXnet DC system monitor, AC and DC wiring boxes, HUB 10.3 communications, surge protector and remote temperature sensor. The FP4 is also equipped with battery and PV array breakers, Input-Output-Bypass assembly, additional AC breakers and mounting for MATE3 and charge controllers. Additional configurations available. ** Overcurrent protective device.



FLEXcoupled Packages

Radian Series and Energy Storage AC-Coupling Solutions



**Integrated Battery Rack
w/ EnergyCell GH Batteries**



**Radian Series Inverter/Charger
w/ GS Load Center**



**Integrated Battery Rack
w/ EnergyCell RE Batteries**

OutBack makes it easy to add battery back-up to any existing installation ideal with two economical FLEXcoupled AC-coupling packages.

Based on OutBack's acclaimed Radian Series inverter/chargers, the FLEXcoupled AC-coupling packages are available in the new 4kW and 8kW Radian Series "A" models for total system power of 3.2kW and 6.4kW, respectively. Additionally, the new Radian Series inverter/chargers feature an Advanced Battery Charging (ABC) profile for compatibility with lithium-ion and other emerging energy storage technologies. Combine with OutBack EnergyCell RE batteries for deep cycle, self-consumption applications or EnergyCell GH batteries for float, back-up applications.

A Prairie Home Invention

Self-Sufficient Living and Work Structure, Laramie, Wyoming

It takes creativity and ingenuity to conceive a net-zero structure in a place where winter climate conditions can get within striking distance of "Antarctic," along with a heavy dose of environmental engineering technology to pull it off. The "envelope house" concept adapted by the home's design/build team relies on unique architecture to harvest passively-collected solar heat during the day and store it for night, placing the home in a thermal "envelope" capable of keeping its occupants comfortably warm by acting like a heat-pump.

Ensuring electrical self-sufficiency required equally innovative measures, including a massive, high-capacity OutBack battery bank capable of storing almost 55kW of energy so safely and securely it's at home in the home's living room, while providing full independence from the grid without using a generator. Comments system designer Jim McGrath, when it comes to "an installation which must perform, there is simply no better choice" than OutBack.





FLEXcoupled Packages

Radian Series and Energy Storage AC-Coupling Solutions

The **FLEXcoupled packages incorporate the OutBack Radian Series inverter/charger with the GS Load Center that is factory pre-wired for AC-coupling applications.** They feature DC overcurrent protection and disconnects, dual AC inputs, grid-tied inverter connection and 120/240VAC maintenance bypass. For additional technical ratings, please see the AC-coupling specsheet at www.outbackpower.com.

Package #1: 8000W FLEXcoupled Radian Series Solution (P/N: FPR-AC-8048A, ideal for an existing PV system from 3-6kW)

Product/Model	Description	Quantity
Radian GS8048A	8000W, 48V 120/240V Radian Series inverter/charger	1
GSLC175-AC-120/240	AC-coupling GS load center	1
MATE3	Advanced system display and communications	1
FW-MB3	MATE3 mounting bracket	1
FW-CABLE250-36R	Red DC cable assemblies	1
FW-CABLE250-36W	White DC cable assemblies	1

Package #2: 4000W FLEXcoupled Radian Series Solution (P/N: FPR-AC-4048A, ideal for an existing 3kW PV system)

Product/Model	Description	Quantity
Radian GS4048A	4000W, 48V 120/240V Radian Series inverter/charger	1
GSLC175-AC-120/240	AC-coupling GS load center	1
MATE3	Advanced system display and communications	1
FW-MB3	MATE3 mounting bracket	1
FW-CABLE250-36R	Red DC cable assemblies	1
FW-CABLE250-36W	White DC cable assemblies	1

Recommended Energy Storage for Back-Up Applications

Product/Model	Description	Quantity
EnergyCell 220GH	VRLA Grid/Hybrid batteries	8
IBR-2-48-175	2-shelf Integrated Battery Rack (IBR)	1

Recommended Energy Storage for Self-Consumption 24/7 Applications

Product/Model	Description	Quantity
EnergyCell 200RE	VRLA Renewable Energy batteries	12
IBR-3-48-175	3-shelf Integrated Battery Rack (IBR)	1

Accessory Parts Kit (for use with separate GS load center)

The accessory parts kit can be used for different applications. These include AC-coupling parallel-stacked inverter/chargers, AC-coupling three-phase Radian Series inverter/chargers, and AC-coupling FX Series inverter/chargers and FLEXpower systems. The kit can also be used in non-AC-coupled applications such as a diversion load to dump the excess energy when the battery voltage rises too high. The kit can also open a circuit breaker, trigger an alarm, or activate an external transfer switch.

P/N GS-10B-AC-120/240

Product/Model	Description	Quantity
ROBC	Remote Operated Circuit Breaker, 50A DPST, 120/240V	1
Relay	8AX2, 12VDC, 250VAC DIN-mount w/LED	1
Relay	8AX2, 48VDC, 250VAC DIN-mount w/LED	1



ENERGY STORAGE

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Energy Storage Solutions

EnergyCell Batteries and Enclosure Systems

When the Director/Chief Editor of the number one clean technology news outlet listed OutBack Power with the “energy storage companies I’m watching like a hawk” in 2015*, it was likely due to OutBack’s innovation and expansion into the category which had transformed the brand from a respected supplier into a leading player. With widespread acclaim and a global following for its power conversion electronics engineered to optimize storage-based systems, it was natural for OutBack to add this essential “building block” to the portfolio—and, in the process, become as renowned for expertise in this key area as inverter/chargers and charge controllers.

The bottom line is that leading solar installers got to where they are by paying careful attention to their bottom lines, and have seen their benefit since switching to OutBack Power energy storage solutions. They save time, money, and most important are able to deliver a better product to happier, more confident customers. With CleanTechnica and many other industry experts noticing, the secret of their success is finally out.

While there are a number of well-known and established brands in the storage and battery segment, leading installers are switching to OutBack Power for a variety of good reasons:

- **One-brand system solution**—OutBack Power is the only single brand with a UL-1741 end-to-end solution, from batteries and rack to rooftop. For installers that means one-stop shopping and a single point of contact for technical and support needs.
- **Integrated approach**—OutBack engineering saves installers valuable time and money on the job, with pre-assembled and wired battery rack solutions and quick connection front-terminal architecture.
- **Reliability and performance**—OutBack’s battery line incorporates nothing but the best technologies, materials and designs including pure-metal composition and Absorbed Glass Mat (AGM) VRLA construction to deliver longer service life, superior shelf life, higher cycle life and maintenance-free operation.
- **Brand assurance**—installers who want to instill the highest possible confidence in their work can count on OutBack’s brand awareness with their customers, leveraging OutBack’s expertise and reputation in mission-critical installations around the globe in every system they spec-in.
- **Complete solution**— OutBack offers a full range of options ideal for nearly any energy storage application. From small, grid-tied to full off-grid, OutBack EnergyCell batteries provide solutions for light commercial, residential and high capacity installations.
- **Industry-leading logistics and support**—including the OnSite Direct battery shipment program, where selected models of factory fresh batteries ship from OutBack directly to the job site within five days of order approval and always at half price**.





EnergyCell® RE Front Terminal

12V VRLA AGM Battery for Renewable Energy Storage



The EnergyCell RE Front Terminal Valve Regulated Lead Acid (VRLA) battery is designed for renewable energy cycling applications. This battery utilizes Absorbed Glass Mat (AGM) technology for efficient gas recombination of up to 99% and freedom from electrolyte maintenance. The EnergyCell RE also features low profile terminals with threaded copper alloy inserts providing reduced maintenance and increased safety.

Product Highlights:

- Front Terminal Access Design for Ease of Installation and Maintenance
- High-Density Pasted Plates
- Long Life in Cycling Applications
- UL-Recognized Component

EnergyCell RE Models:	EnergyCell 170RE	EnergyCell 200RE
Cells per Unit	6	6
Voltage per Unit	12VDC	12VDC
Operating Temperature Range (w/ temperature compensation)	Discharge: -40 to 71°C (-40 to 160°F) Charge: -23 to 60°C (-10 to 140°F)	Discharge: -40 to 71°C (-40 to 160°F) Charge: -23 to 60°C (-10 to 140°F)
Optimal Operating Temperature Range	23 to 27°C (74 to 80°F)	23 to 27°C (74 to 80°F)
Recommended Maximum Charging Current Limit per String	25ADC	30ADC
Float Charging Voltage	13.62VDC / unit average at 25°C (77°F)	13.62VDC / unit average at 25°C (77°F)
Equalization and Cycle Service Charging Limits	14.4VDC / unit average at 25°C (77°F)	14.4VDC / unit average at 25°C (77°F)
Maximum Charge Rate	46.14A	53.40A
Self Discharge	Battery can be stored up to 6 months at 25°C (77°F) before a freshening charge is required. Batteries stored at temperatures greater than 25°C (77°F) will require recharge sooner than batteries stored at lower temperatures.	
Temperature Compensation Factor (Charging)	5mV per °C per cell (2V)	5mV per °C per cell (2V)
Terminal	Threaded copper alloy insert terminal to accept ¼"-20 UNC bolt	Threaded copper alloy insert terminal to accept ¼"-20 UNC bolt
Terminal Hardware Initial Torque	110in-lbs (12.4Nm)	110in-lbs (12.4Nm)
Weight	115 / 52	131 / 60
Dimensions H x D x W (in/cm)*	11.14 x 22.01 x 4.95 / 28.3 x 55.9 x 12.6	12.60 x 22.01 x 4.95 / 32.0 x 55.9 x 12.6

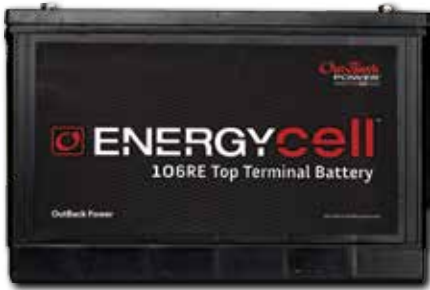
Discharge in Hours:	12V Ampere Hour Capacity to 1.75 Volts Per Cell at 77°F (25°C)										
	1	2	3	4	5	8	12	20	24	48	100
EnergyCell 170RE	89.1	103.5	114.3	120.4	126.0	136.8	145.2	153.8	156.9	163.6	169.9
EnergyCell 200RE	103.0	120.0	132.0	139.6	145.5	158.4	168.0	178.0	181.4	189.6	200.0

*Batteries to be installed with 0.5 in (12.7 mm) spacing minimum and free air ventilation.



EnergyCell® RE Top Terminal

12V VRLA AGM Battery for Renewable Energy Storage



The EnergyCell RE Top Terminal Valve Regulated Lead Acid (VRLA) battery is designed for high power density in renewable energy cycling applications. It features Absorbed Glass Mat (AGM) technology for efficient gas recombination of up to 99%, and freedom from electrolyte maintenance. EnergyCell RE batteries also feature low profile terminals with threaded copper alloy inserts providing increased safety and reduced maintenance.

Product Highlights:

- Long Life in Cycling Applications
- Grid Design Optimized for High Power Density
- Absorbed Glass Mat (AGM) Technology for Efficient Gas Recombination
- UL-Recognized Component

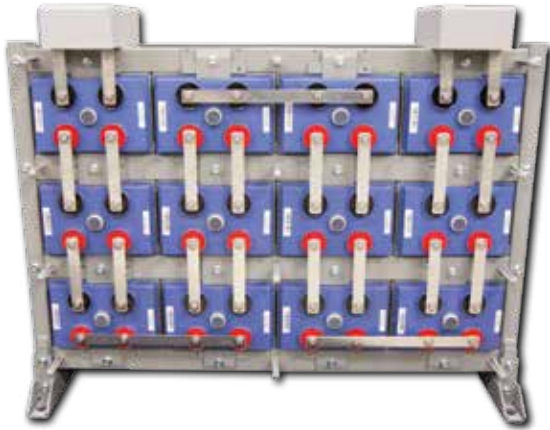
Models:	EnergyCell 34RE	EnergyCell 52RE	EnergyCell 78RE	EnergyCell 95RE	EnergyCell 106RE
Cells Per Unit	6	6	6	6	6
Voltage Per Unit	12VDC	12VDC	12VDC	12VDC	12VDC
Operating Temperature Range (w/ temperature compensation)	Discharge: -40 to 71°C (-40 to 160°F) Charge: -23 to 60°C (-10 to 140°F)	Discharge: -40 to 71°C (-40 to 160°F) Charge: -23 to 60°C (-10 to 140°F)	Discharge: -40 to 71°C (-40 to 160°F) Charge: -23 to 60°C (-10 to 140°F)	Discharge: -40 to 71°C (-40 to 160°F) Charge: -23 to 60°C (-10 to 140°F)	Discharge: -40 to 71°C (-40 to 160°F) Charge: -23 to 60°C (-10 to 140°F)
Optimal Operating Temperature Range	23 to 27°C (74 to 80°F)	23 to 27°C (74 to 80°F)	23 to 27°C (74 to 80°F)	23 to 27°C (74 to 80°F)	23 to 27°C (74 to 80°F)
Recommended Maximum Charging Current Limit Per String	C/5A @ 20Hr rate	C/5A @ 20Hr rate	C/5A @ 20Hr rate	C/5A @ 20Hr rate	C/5A @ 20Hr rate
Float Charging Voltage	13.5 to 13.8VDC unit average at 25°C (77°F)	13.5 to 13.8VDC unit average at 25°C (77°F)	13.5 to 13.8VDC unit average at 25°C (77°F)	13.5 to 13.8VDC unit average at 25°C (77°F)	13.5 to 13.8VDC unit average at 25°C (77°F)
Equalization and Cycle Service Charging Limits	14.4 to 14.8VDC unit average at 25°C (77°F)	14.4 to 14.8VDC unit average at 25°C (77°F)	14.4 to 14.8VDC unit average at 25°C (77°F)	14.4 to 14.8VDC unit average at 25°C (77°F)	14.4 to 14.8VDC unit average at 25°C (77°F)
Maximum Charge Rate	9.9A	15.0A	22.5A	26.4A	30.0A
Self Discharge	Battery can be stored up to 6 months at 25°C (77°F) before a freshening charge is required. Batteries stored at temperatures greater than 25°C (77°F) will require recharge sooner than batteries stored at lower temperatures.				
Terminal	Copper alloy insert terminal to accept 10"-32 UNC bolt		Copper alloy insert terminal to accept ¼"-20 UNC bolt		
Terminal Hardware Initial Torque	30in-lbs (3.4Nm)	30in-lbs (3.4Nm)	110in-lbs (12.4Nm)	110in-lbs (12.4Nm)	110in-lbs (12.4Nm)
Weight (lb/kg)	27 / 12.2	40 / 18.1	54 / 24.5	64 / 29	69 / 31.3
Dimensions H x D x W (in/cm)	6.80 x 7.76 x 5.19 / 17.27 x 19.7 x 13.18	8.07 x 9 x 5.48 / 20.51 x 22.86 x 13.92	8.01 x 10.76 x 6.83 / 20.35 x 27.32 x 17.34	8.06 x 12.51 x 6.83 / 20.48 x 31.78 x 17.34	8.52 x 13.42 x 6.80 / 21.64 x 34.09 x 17.27

Discharge in Hours:	12V Ampere Hour Capacity to 1.75 Volts Per Cell at 77°F (25°C)										
	1	2	3	4	5	8	12	20	24	48	100
EnergyCell 34RE	19.7	23.6	26.1	28	29	30.4	31.7	33	33	33.6	34
EnergyCell 52RE	29.6	35.1	38.9	41.4	43.3	46	48	50	50.4	51.3	52
EnergyCell 78RE	43.5	53.2	58.5	62	64.5	69.6	72	75	75.6	77	78
EnergyCell 95RE	47	58	66	70.8	74	79.2	83.6	88	88.8	91	95
EnergyCell 106RE	49.2	61.5	70	76	80.6	89	94.2	100	101	102.6	106



EnergyCell® RE High Capacity

24/48V VRLA AGM Battery Bank



The EnergyCell RE High Capacity battery family offers an ideal solution for large capacity Valved Regulated Lead Acid (VRLA) battery requirements. The EnergyCell RE High Capacity battery's steel can (module) design concept, with its integral racking system, provides a cost effective battery system with a compact, quick and simple installation process.

The EnergyCell RE high capacity battery system's AGM technology incorporates an enhanced cell design with a superior racking system. The enhanced cell incorporates thicker positive plates for longer life. The welded/epoxy dual post seal design provides the highest integrity seal in the industry. The large copper post design also enhances the high rate performance. The EnergyCell RE high capacity battery provides excellent performance and service life in grid-tied, grid-interactive and off-grid renewable energy and UPS solutions.

Product Highlights:

- Ideal for Applications Requiring Large Capacity VRLA Batteries
- 100% Out-of-Box Initial Battery Capacity
- Low Maintenance, No Watering Required
- 24 and 48V Options Available in Standard Configurations

Models:	800RE	1100RE	1300RE	1600RE	2000RE	2200RE	2700RE
Nominal Voltage Per Cell	2V	2V	2V	2V	2V	2V	2V
Capacity 20Hr Rate (1.75VPC)	672	960	1148	1378	1716	1836	2288
Capacity 100Hr Rate (1.75VPC)	810	1150	1340	1600	2070	2140	2770
Watts Per Cell 15min Rate (1.67VPC)	1230	1757	1995	2394	3071	3192	4094
Cycle Life 50% DOD (77°F/25°C)	1800 cycles	1800 cycles	1800 cycles	1800 cycles	1800 cycles	1800 cycles	1800 cycles
Optimal Operating Temperature Range	73.4 to 78.8°F (23 to 26°C)	73.4 to 78.8°F (23 to 26°C)	73.4 to 78.8°F (23 to 26°C)	73.4 to 78.8°F (23 to 26°C)	73.4 to 78.8°F (23 to 26°C)	73.4 to 78.8°F (23 to 26°C)	73.4 to 78.8°F (23 to 26°C)
OCV Per Cell Limit*	2.05	2.05	2.05	2.05	2.05	2.05	2.05
Initial Charge Voltage Per Cell**	2.27	2.27	2.27	2.27	2.27	2.27	2.27
Float Voltage Per Cell (77°F/25°C)	2.25	2.25	2.25	2.25	2.25	2.25	2.25
Float Voltage Per Cell (95°F/35°C)	2.21	2.21	2.21	2.21	2.21	2.21	2.21
Equalize Voltage Per Cell (69.8 to 89.6°F/21 to 32°C)	2.32	2.32	2.32	2.32	2.32	2.32	2.32
Maximum Charge Current (A)	148.75	212.5	250	300	375	400	500
Shelf Life (77°F/25°C)	6 months	6 months	6 months	6 months	6 months	6 months	6 months
Short Circuit Current (A)	4728	6748	7722	9267	12411	12337	16548
Internal Resistance (micro Ohm)	441	309	270	225	167	169	126
Terminal Torque (Inter cell Connects)	88in-lbs	88in-lbs	88in-lbs	88in-lbs	88in-lbs	88in-lbs	88in-lbs
Hardware Specification (Inter cell Connects)	M8 bolt, lock and flat washer	M8 bolt, lock and flat washer	M8 bolt, lock and flat washer	M8 bolt, lock and flat washer	M8 bolt, lock and flat washer	M8 bolt, lock and flat washer	M8 bolt, lock and flat washer
Weight Per Cell (lbs/kg)	114.3 / 51.8	162.3 / 73.6	188.3 / 85.4	222.3 / 100.8	272.3 / 123.5	290.3 / 131.7	358.3 / 162.5
Dimensions	Please refer to the OutBack EnergyCell High Capacity specifications poster for system dimensions.						

*Before installation OCV is open circuit voltage.

**Represents 60Hrs charge time at 16 to 32°C.



EnergyCell® GH

VRLA Battery for Grid/Hybrid Storage



The EnergyCell GH Valve Regulated Lead Acid (VRLA) battery is designed for Grid/Hybrid storage applications. EnerSys SBS EON technology incorporates TPPL AGM (Thin Plate Pure Lead Advanced Glass Mat) which allows for greater shelf life, extended float service life in optimal operating conditions, and higher energy density. The EnergyCell GH also features front terminal access with threaded copper inserts providing low maintenance and increased safety.

Product Highlights:

- Ideal for Grid/Hybrid Applications
- Front Terminal Access Design for Ease of Installation and Maintenance
- Wide Operating Temperature Range
- UL-Recognized Component

Models:	EnergyCell 200GH	EnergyCell 220GH
Cells Per Unit	6	6
Voltage Per Unit	12VDC	12VDC
Operating Temperature Range (w/ temperature compensation)	-40 to 122°F (-40 to 50°C)	-40 to 122°F (-40 to 50°C)
Optimal Operating Temperature Range	68°F (20°C)	68°F (20°C)
Float Charging Voltage	13.62VDC / unit average at 77°F (25°C)	13.62VDC / unit average at 77°F (25°C)
Maximum Charge Current	Up to 6x C/10A	Up to 6x C/10A
Equalization and Cycle Service Charging Limits	14.4VDC / unit average at 77°F (25°C)	14.4VDC / unit average at 77°F (25°C)
Maximum Charge Rate	106.2A	118.8A
Self Discharge	Battery can be stored up to 18 months at 77°F (25°C) before a freshening charge is required. Batteries stored at temperatures greater than 77°F (25°C) will require recharge sooner than batteries stored at lower temperatures.	
Temp Compensation Factor (Charging)	±4mV per °C per cell (2V)	±4mV per °C per cell (2V)
Terminal	Threaded copper alloy insert terminal to accept ¼"-20 UNC bolt	Threaded copper alloy insert terminal to accept ¼"-20 UNC bolt
Terminal Hardware Initial Torque	M6 = 80in-lbs (9.0Nm)	M6 = 80in-lbs (9.0Nm)
Weight (lb/kg)	116 / 53	132 / 60
Dimensions H x D x W (in/cm)	11.1 x 22.1 x 4.9 / 28.2 x 56.1 x 12.4	12.4 x 22.1 x 4.9 / 31.5 x 56.1 x 12.4

Discharge in Hours:	12V Ampere Hour Capacity to 1.75 Volts Per Cell at 77°F (25°C)								
	1	3	4	5	8	12	20	24	100
EnergyCell 200GH	120	148.5	154.8	159	168.8	176.4	191	189.6	200
EnergyCell 220GH	133.5	166.2	173.2	178	188.8	198	214	216	220



Indoor Battery Rack

Indoor Energy Storage



IBR-2



IBR-3

The OutBack Integrated Battery Racks are a comprehensive battery enclosure solution with cell interconnects, cabling, and series string overcurrent protection and disconnects included, making it easy to order and install. All electrical connections are made at the factory and ship fully assembled with the exception of the batteries, which can be quickly added and connected on the jobsite.

Unlike typical steel racks, the OutBack design is crafted of powder-coated aluminum, resulting in a rack that maintains a clean, durable appearance even in challenging environments while weighing less than 90 pounds. The IBR-2 is sized to fit under an OutBack Radian Series inverter/charger to reduce system component “clutter” and make the best use of installation space.

Product Highlights:

- Ideal for Use With OutBack Radian and FLEXpower Systems
- Overcurrent Protection on Each Battery String
- Well-Ventilated for Safety and Longevity
- Pre-Wired for Ease of Installation
- Designed to Meet UL1741

Models:	IBR-2-48-175	IBR-3-48-175
Dimensions H x W x D (in/cm)	33 x 27.0 x 21.25 / 83.8 x 68.6 x 53.9	48.6 x 27.0 x 24.4 / 123.4 x 68.6 x 61.9
Weight w/out Batteries (lb/kg)	60 / 27	89 / 40.4
Physical Characteristics	0.125-inch thick aluminum enclosure with FLEXware silver finish; plated copper bus bars and clear protective covers. Ships fully assembled (except for batteries)	
String Overcurrent Protection	175ADC	175ADC
Gauge of Conductors	1/0 AWG	1/0 AWG
Capacity	Up to 8 EnergyCell batteries	Up to 12 EnergyCell batteries
Nominal System Voltage	48VDC	48VDC
Supported Batteries	EnergyCell 200RE, EnergyCell 170RE, EnergyCell 200GH, EnergyCell 220GH	EnergyCell 200RE, EnergyCell 170RE, EnergyCell 200GH, EnergyCell 220GH

Keeping an Ancient Culture Up-to-Date

Tumul K'in Mayan School, Belize Rainforest

Modern-day descendants of the venerable Mayan civilization received a boost for education for their children when a European benefactor group provided financial assistance for a new school and cultural center in the rainforest near the town of Toledo in Belize. Because access to the location is by river using a longboat, the power system—which has the dual job of providing energy as well as educating students in sustainable technology—had to deliver high output from a relatively compact size and have the reliability to operate dependably in an isolated location where a replacement is not just around the corner.

System designer/installers chose the OutBack FLEXware 500 to provide renewable energy and a teaching platform for the school's 30 students. Because the facility also serves as a cultural center for traditional Mayan ceremonies, celebrations and gatherings, its state-of-the-art renewable energy system has become a benchmark throughout the region for the potential of solar power to improve quality of life.





Indoor Battery Enclosure

Indoor Energy Storage



IBE-1



IBE-2

The standard series IBE enclosure family from OutBack Power is engineered for use with maintenance-free, top terminal EnergyCell batteries and is ideally suited for value-oriented applications requiring up to 212Ah of energy storage.

The IBE series features welded, all aluminum construction and powder-coated finish for strength and durability. Removable, lockable doors keep batteries and wiring secure and protected. A mesh screen allows for ventilation of the enclosure, helping to keep batteries cool. The IBE series also ships pre-assembled with battery wiring kits included for ease of installation.

Product Highlights:

- Aluminum Welded Construction and Powder-coated Exterior
- Ideal for Value-Oriented Applications Up to 212Ah of Storage
- Optimized for Use with EnergyCell RE Top Terminal Batteries
- No Assembly Required, Battery Cable Kit Included
- CSA/UL Certified to Meet Applicable Industry Standards

Models:	IBE-1	IBE-2
Dimensions H x W x D (in/cm)	33.5 x 26 x 15 / 85.1 x 66.0 x 38.1	48 x 26 x 15 / 121.9 x 66.0 x 38.1
Weight w/out Batteries (lb/kg)	61 / 28	75 / 34
Material	Exterior powder-coated aluminum	Exterior powder-coated aluminum
Vent Screen	Mesh fabric with .005 x .005in (.12 x .12mm) opening size to minimize snow, water and dust ingress	Mesh fabric with .005 x .005in (.12 x .12mm) opening size to minimize snow, water and dust ingress
Door and Lid Seal	Poron gasketing	Poron gasketing
Color	Gray (custom colors available)	Gray (custom colors available)
Lid	Removable	Removable
Door	Removable/lockable	Removable/lockable
Part Number	IBE-1-48-001	IBE-2-48-001

Powering a True National Treasure

Pinnacles National Monument Visitors' Center, California

Created by Teddy Roosevelt in 1908, this beloved central California landmark is a wildlife refuge and mecca for rock climbers, trail hikers and nature lovers throughout the U.S. and around the world, thanks to its postcard-perfect rock formations and unique San Andreas-forged geology. Following the park's centennial, the American Recovery and Reinvestment Act upgraded it with a new Visitors' Center to better accommodate the more than 60,000 people coming to Pinnacles each year.

With the goal of getting the new Center entirely off-grid, the system designer/installer selected for the project, American Incorporated of Visalia, California, was faced with field-powering not only a visitors' center with vending machines and lighting, but also an entry station, maintenance/fire/EMS building, and maintenance yard. **They decided on a 36kW system consisting of roof-mounted PV panels and 10 OutBack inverterchargers in two FLEXware 1000 and one FLEXware 500 configurations.** With its new off-grid powered visitor facilities, Pinnacles National Monument enters its second century with another landmark status as a showcase for green technology.





Outdoor Battery Enclosure

Outdoor Energy Storage



OutBack Power's Outdoor Battery Enclosure (OBE) is engineered to provide end users and installers with a professional, factory pre-wired, rugged, easy-to-install NEMA 3R rated solution for "outside-the-home" energy storage.

The OBE series is designed for seamless integration with OutBack's EnergyCell RE Top Terminal batteries, capable of holding up to 12 EnergyCell 106RE batteries (three strings, four batteries per string). The OBE series ships pre-assembled, eliminating the need for time consuming onsite assembly.

Product Highlights:

- Up to 318Ah or 15.3kWh of Storage
- NEMA 3R Rating
- No Assembly Required—Ships Pre-Assembled
- Standard Security Locks Restrict Access
- Battery Cable Kit Included

Model:	OBE-3
Dimensions H x W x D (in/mm)	46.8 x 41.5 x 17 / 1188.7 x 1054.1 x 431.8
Weight w/out Batteries (lb/kg)	135 / 62
Material	Exterior powder-coated aluminum
Vent Screen	Mesh fabric with .005 x .005in (.12 x .12mm) opening size to minimize snow, water and dust ingress
Door and Lid Seal	Poron gasketing
Color	Gray (custom colors available)
Lid	Removable
Door	Removable/lockable
Part Number	OBE-3-48-002
Included Components	Enclosure, battery cable kit, flex intercell connects, concrete sleeve anchors, user's manual, wiring diagram

The Zero-Sum Grid Solution

Home-Based Manufacturing Business, Halliburton, Ontario

Life in a quaint, picturesque Canadian village is about as perfect as it gets—except for the disproportionately high cost of electricity due to an old grid infrastructure, and wildly fluctuating utility rates. For George and Elaine Schmid who operate their Halliburton Soap Factory craft business out of their home, bringing the variable cost of electricity in line was the bottom-line urgency that connected them with Halliburton Solar and Wind, where Brian Nash—a recent graduate of OutBack Power's NABCEP-registered installation training program, had the ideal solution: the GridZero capable Radian inverter/charger.

By designing his 14kW solar electricity system around this platform, Brian provided the Schmidts with the ability to power their business off-grid during typical conditions, with the GridZero Radian tapping the grid only when needed for peak demand—no small feat in Ontario's restrictive utility environment. **The nearly 50% reduction in annual utility electricity costs gave the Schmidts the bottom-line boost they needed for their business. As Brian Nash summarized the results, "energy resilience meets grid independence. It's awesome."**





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FLEXware™ ICS

Integrated Combiner Solution



The OutBack Power FLEXware ICS combiner boxes are cost-effective integrated solutions for solar installations requiring basic combining and overcurrent protection needs. The FLEXware ICS offers value, simplicity, and ease of installation in a single solution.

OutBack Power FLEXware ICS Advantages:

- When used with OutBack power conversion and energy storage components, the system will represent the only UL-1741 end-to-end single brand solution
- Easy-to-install fuses offer bi-directional overcurrent protection
- Vertical wall-mount, pole-mount or sloped roof-mount to 14° incline (3 in 12 roof pitch)
- Low-profile design allows for flexible mounting options
- NEMA 3R, powder-coated aluminum enclosure protects against environmental exposure
- Pre-configured and integrated design reduces installation time in the field

Models:	FWPV6	FWPV4-FH600	FWPV6-FH600
Enclosure Material	Powder-coated aluminum with stainless steel hardware	Powder-coated aluminum with stainless steel hardware	Powder-coated aluminum with stainless steel hardware
Mounting Options	Vertical wall mount, pole mount or sloped roof mount to 14 degrees incline (3 in 12 roof pitch)		
Enclosure Rating	Outdoor rainproof, UL type NEMA 3R	Outdoor rainproof, UL type NEMA 3R	Outdoor rainproof, UL type NEMA 3R
Enclosure Security	Padlock hole in chassis for up to 3/8" padlock	Padlock hole in chassis for up to 3/8" padlock	Padlock hole in chassis for up to 3/8" padlock
Output Terminals	#14 to 2/0 AWG (2.08 to 67.4 mm ²)	#14 to 2/0 AWG (2.08 to 67.4 mm ²)	#14 to 2/0 AWG (2.08 to 67.4 mm ²)
Number of Separate Output Circuits	1	1	1
Total Maximum Current	96A	64A	96A
Overcurrent Protection	Not included, can accommodate (up to 6) 600VDC fuse holders	(4) DIN rail fuse holders that can accommodate up to 20A, 600V fuses (fuses sold separately)	(6) DIN rail fuse holders that can accommodate up to 20A, 600V fuses (fuses sold separately)
Input Terminals	Cable Glands #14 to 8 AWG (2.08 to 8.4 mm ²)	Cable Glands #14 to 8 AWG (2.08 to 8.4 mm ²)	Cable Glands #14 to 8 AWG (2.08 to 8.4 mm ²)
Certifications	UL 1741, CSA 22.2, CE	UL 1741, CSA 22.2, CE	UL 1741, CSA 22.2, CE
Unit Weight (lb/kg)	2.5 / 1.1	3.2 / 1.5	3.5 / 1.6
Unit Dimensions H x D x W (in/cm)	11.5 x 8.25 x 3.75 / 29.2 x 21.0 x 9.5	11.5 x 8.25 x 3.75 / 29.2 x 21.0 x 9.5	11.5 x 8.25 x 3.75 / 29.2 x 21.0 x 9.5
ICS Accessories	FUSE-15-600VDC/10: Box of (10) x 15A fuses FUSE-20-600VDC/10: Box of (10) x 20A fuses FH-30-1000VDC-DIN: 30A, 1000VDC fuse holder		

Model:	CABLEGLAND-5
Description	Skinned over cable gland and strain relief. Accommodates up to five PV source circuits
Maximum Wire Diameter	7.7mm
Maximum Wire Rating	IP68



FLEXware™ ICS Plus*

NEC 2014 Compliant Integrated Combiner Solution



The OutBack FLEXware ICS Plus is a safe, smart and flexible NEC 2014 compliant integrated combiner solution. It offers an array of benefits including DC arc fault protection, rapid shutdown and load break disconnecting means.

OutBack Power FLEXware ICS Plus Advantages:

- The only solution that offers DC arc fault protection, rapid shutdown, and load break disconnecting means in a single UL listed system
- When used with OutBack power conversion and energy storage components, the system will represent the only UL-1741 end-to-end single brand solution
- Pre-configured and integrated for reduced installation time
- NEMA 3R rated enclosures protect against environmental exposure

Models:	FWPV6-15B150-A	FWPV6-15B150-SDA	FWPV6-15F600-SDA
Enclosure Material	Powder-coated aluminum with stainless steel hardware	Powder-coated aluminum with stainless steel hardware	Powder-coated aluminum with stainless steel hardware
Mounting Options	Vertical to horizontal mount. Mounting brackets available for pole, roof or solar racking.		
Enclosure Rating	Outdoor rainproof, UL type 3R	Outdoor rainproof, UL type 3R	Outdoor rainproof, UL type 3R
Enclosure Security	Padlockable latch	Padlockable latch	Padlockable latch
Output Terminals	#14 to 2/0 AWG (2.08 to 67.4 mm ²)	#14 to 2/0 AWG (2.08 to 67.4 mm ²)	#14 to 2/0 AWG (2.08 to 67.4 mm ²)
Number of Separate Circuits	1	1	1
Total Maximum Current	80A	80A	80A
Over Current Protection	(6) 15A, 150VDC DIN rail breakers	(6) 15A, 150VDC DIN rail breakers	(6) 15A, 150VDC DIN rail breakers
Contactor Voltage Rating	600VDC	600VDC	600VDC
Input Terminals	#14 to 6 AWG (2.08 to 13.3 mm ²)	#14 to 6 AWG (2.08 to 13.3 mm ²)	#14 to 6 AWG (2.08 to 13.3 mm ²)
Rapid Shutdown Compatibility	No	Yes	Yes
External Disconnect	No	Yes	Yes
Arc Fault Circuit Interrupter (AFCI)	Yes	Yes	Yes
Certifications	UL1741, UL1699B, CSA22.2, FCC Class B	UL1741, UL1699B, CSA22.2, FCC Class B	UL1741, UL1699B, CSA22.2, FCC Class B
Unit Weight (lb/kg)	~20 / 9.1	~20 / 9.1	~20 / 9.1
Unit Dimensions H x D x W (in/cm)	16 x 19 x 4.5 / 40.6 x 48.3 x 11.4	16 x 19 x 4.5 / 40.6 x 48.3 x 11.4	16 x 19 x 4.5 / 40.6 x 48.3 x 11.4

Junction Box Models:	FW1-S600	FW2-S600
Enclosure Material	Powder-coated aluminum with stainless steel hardware	
Mounting Options	Vertical to horizontal mount. Mounting brackets available for pole, roof or solar racking.	
Enclosure Rating	Outdoor rainproof, UL type 3R	Outdoor rainproof, UL type 3R
Enclosure Security	Padlock hole in chassis	Padlock hole in chassis
Terminals	#14 - 2/0 AWG (2.08 to 67.4 mm ²)	
Number of Controlled Conductors	1	2
Total Maximum Current	120A	120A
Contactor Voltage Rating	600VDC	600VDC
Rapid Shutdown Compatibility	Yes	Yes
Certifications	UL1741, CSA22.2, FCC Class B	UL1741, CSA22.2, FCC Class B
Unit Weight (lb/kg)	~18 / 8.2	~19 / 8.6
Unit Dimensions H x D x W (in/cm)	19 x 14 x 4.5 / 48.3 x 35.6 x 11.4	

RSI Model:	Rapid Shutdown Interface
Enclosure Material	Powder-coated aluminum with stainless steel hardware
Mounting Options	Vertical wall mount or pole mount
Enclosure Rating	Outdoor rainproof, UL type 3R
Communications Cable	Standard CAT5
Rapid Shutdown Compatibility	Yes
LED Indication	Solar on, Solar off, AFCI. Verification of a successful rapid shutdown event.
Switch	Initiates a rapid shutdown event and resets contactors. Can be locked in off position.
Certifications	UL1741, CSA22.2, FCC Class B
Unit Weight (lb/kg)	~7 / 3.2
Unit Dimensions H x D x W (in/cm)	12 x 7 x 5 / 30.5 x 17.8 x 12.7



FLEXware™ PV Combiner Box Series

Advanced Photovoltaic Combiner

FLEXware PV Combiner Boxes

The FLEXware PV Combiner Box Series provides installers with essential, proven, and simple-to-use PV balance-of-system hardware. Ideal for both small and large systems, the FLEXware PV8 and FLEXware PV12 accommodates an application's overcurrent protection requirements. From 150VDC breakers to 600VDC fuse holders, the FLEXware PV Combiner Box Series handles it all.

Designed to survive in outdoor environments, the rainproof, UL-type 3R powder-coated aluminum chassis can be mounted on a wall, sloped roof or pole. The unique angled negative terminal bus bar design makes wiring fast and easy without the common problem of larger output conductors blocking access to the smaller input terminals. Dual output lug terminals are included for up to 2/0 AWG conductors. The tinted flame-retardant polycarbonate "dead" front panel creates a clean appearance while preventing accidental contact with the live terminals and is easily removable during installation.



Models:	FWPV-8	FWPV-12
Enclosure Material	Powder-coated aluminum with stainless steel hardware	Powder-coated aluminum with stainless steel hardware
Mounting Options	Vertical wall mount, pole mount or sloped roof mount to 14 degrees incline (3 in 12 roof pitch)	Vertical wall mount, pole mount or sloped roof mount to 14 degrees incline (3 in 12 roof pitch)
Enclosure Rating	Outdoor Rainproof, NEMA 3R	Outdoor Rainproof, NEMA 3R
Enclosure Security	Padlock hole in chassis and cover for up to 3/8 inch padlock	Padlock hole in chassis and cover for up to 3/8 inch padlock
Output Terminals*	#14 to 2/0 AWG (2.08 to 67.4 mm ²)	#14 to 2/0 AWG (2.08 to 67.4 mm ²)
Number of Separate Circuits	One circuit	One or two circuits
Total Maximum Current	120A	180A
Number of 150VDC Breakers	Up to 8	Up to 12 (two groups of 6)
Number of Fuse Holders	Up to 6	Up to 8 (two groups of 4)
Input Terminal	150VDC breakers: #14 to 6 AWG (2.08 to 13.3 mm ²) 600VDC fuse: #14 to 10 AWG (2.08 to 5.26 mm ²)	150VDC breakers: #14 to 6 AWG (2.08 to 13.3 mm ²) 600VDC fuse: #14 to 10 AWG (2.08 to 5.26 mm ²)
Certifications	ETL Listed to UL1741, UL67, CSA22.2 #29	ETL Listed to UL1741, UL67, CSA22.2 #29
Weight (lb/kg)	Unit: 4.4 / 2.0 Shipping: 5.5 / 2.5	Unit: 5.9 / 2.7 Shipping: 7.4 / 3.3
Dimensions H x W x L (in/cm)	Unit: 15.2 x 9.2 x 3.9 / 38.7 x 23.3 x 9.9 Shipping: 19 x 9.5 x 4.3 / 48.3 x 24.1 x 10.9	Unit: 15.2 x 12.7 x 3.9 / 38.7 x 32.2 x 9.9 Shipping: 19 x 13 x 4.3 / 48.3 x 33 x 10.9



FLEXware™ Mounting Plate

For Use with FLEXware 500 & FLEXware 1000 Enclosures

FLEXware Mounting Plate (MP)

The FLEXware MP is a one-piece, powder-coated aluminum mounting plate for FLEXware 500 and FLEXware 1000 enclosures. Using stainless steel mounting hardware, the integrated locating bolts make installation quick and easy by providing guides to line up enclosures and inverter/chargers. A single FLEXware MP is designed to accommodate a FLEXware 500 while two FLEXware MPs are utilized in a FLEXware 1000 configuration.

Single MP Configuration for FLEXware 500

Side View of Integrated Locating Bolts

Dual MP Configuration for FLEXware 1000

Angled View of Integrated Locating Bolts

Model:	FW-MP
Description	FLEXware system mounting plate
Shipping Weight (lb/kg)	14 / 6.4
Dimensions H x W x D (in/cm)	Unit: 20.3 x 46.3 x 0.8 / 51.6 x 117.6 x 2.1 Shipping: 1.15 x 22.9 x 48.4 / 2.9 x 58.2 x 123

Note: Use appropriate wire size in accordance with NEC.



FLEXware™ 250

Integration Enclosures and Hardware

FLEXware 250 Integration Hardware

Designed for applications with moderate power requirements such as cabins, chalets, homes, remote communication sites and backup power systems, the FLEXware 250 accommodates all essential protective devices in the smallest possible space and at the lowest installed cost. With their extremely compact design and unique mounting features, one or two FLEXware 250 enclosures can be mounted on each end of a single FX Series inverter/charger.

The powder-coated aluminum and ETL-listed (UL1741) FLEXware 250 enclosure provides spaces for battery, PV array or PV GFDI breakers and mounting locations for AC GFCI outlet, AC breakers and an Input-Output-Bypass Assembly. In keeping with FLEXware design concept, the FLEXware 250's flexibility is evident in the generous number of knock-outs allowing the installation of conduit, cable glands, and other installation accessories.



Side View



Front View

Breaker Configuration Diagram

Holds up to four 0.75" (19 mm) wide AC rated panel mount breakers (not included with bare chassis) rated for 1-60AAC current.

Provision for optional AC Input-Output-Bypass assembly.

Holds one 120V US outlet receptacle or one 230V European outlet receptacle.

New feature includes terminal bus bar to accommodate an isolated neutral bus in AC applications.



AC Side



DC Side

Holds up to four 0.75" (19 mm) wide DC rated panel mount breakers (not included with bare chassis) rated for 1-80ADC current.

Holds one 1.5" (39 mm) wide 175 or 250A breaker, or one 1.02" (26 mm) wide 100 or 125A breaker. Includes large DC breaker handle guard.

New feature includes DC negative bus for DC applications.

Knockout Location Diagram

AC Side	• (1) 2" knockout (2.468" diameter) • (1) 1" knockout (1.359" diameter)	
DC Side	• (1) 2" knockout (2.468" diameter) • (2) 1/2" knockout (0.875" diameter)	
Front	• (1) 2" knockout (2.468" diameter) • (2) 1" knockout (1.359" diameter)	
Bottom	• (1) 1/2" knockout (0.875" diameter)	



FLEXware™ 250

Integration Enclosures, Hardware and Sample Bill of Materials

Model:	FLEXware 250*
Description	DC and/or AC breaker enclosure for one FX Series inverter/charger
Includes	Ground busbar, DC breaker handle guard, breaker mounting hardware and enclosure mounting hardware
Enclosure Type	Type-1 indoor (IP30)
Shipping Weight (lb/kg)	5 / 2.3
Dimensions H x W x D (in/cm)	Unit: 7.5 x 6.5 x 8.6 / 19.1 x 16.5 x 21.8 Shipping: 9.75 x 8.4 x 11.6 / 24.8 x 21.3 x 29.5

Models:	FLEXware 250 AC Input-Output-Bypass Assemblies	
	FW-IOBS-120VAC	FW-IOBS-230VAC
Description	Field-installable kit for by-passing the AC input to the AC output for inverter maintenance, testing or installation. Also provides over-current protection for AC input and output.	
Includes	(3) 60A 120VAC single pole panel mount breakers, sliding bypass interlock plate, wire and hardware kit	(3) 30A 230VAC single pole panel mount breakers, sliding bypass interlock plate, wire and hardware kit
System Rating	Single-phase 120VAC 60A 7.2kW	Single-phase 230VAC 30A 6.9kW
Bypass Breaker	One Pole @ 60A 7.2kW	One Pole @ 30A 6.9kW
Input Breaker	One Pole @ 60A 7.2kW	One Pole @ 30A 6.9kW
Output Breaker	One Pole @ 60A 7.2kW	One Pole @ 30A 6.9kW

FW-IOBS-120VAC Sample Bill of Materials (w/one OutBack VFX3524 inverter/charger):

Part Number	Description	Quantity
VFX3524 inverter/charger	3500W, 24VDC, 85A charger, 60AAC input	1
FW250	DC and/or AC breaker enclosure, secures directly to either end of an FX/VFX Series inverter/charger	2
PNL-250-DC	250A, 125VDC, 3/8" stud terminals	1
FW-IOBS-120VAC	Single inverter Input-Output-Bypass for FW250 only	1
MATE	System display and communications	1
HUB4	Four port, up to 4 devices and one MATE	1
FLEXnet DC	Multi-channel DC system monitoring device	1
FW-SHUNT250	500A, 50mVDC current shunt with attached terminal bus bar for mounting on top of an FX/VFX Series inverter/charger	1
FW-Cable175-15R	175A 2/0 AWG DC cable 15" (38 cm) long with ring terminals on both ends with red heat shrink	1

FW-IOBS-230VAC Sample Bill of Materials (w/one OutBack VFX3024E inverter/charger):

Part Number	Description	Quantity
VFX3024E inverter/charger	3000W, 24VDC, 85ADC charger, 30AAC input	1
FW250	DC and/or AC breaker enclosure, secures directly to either end of an FX/VFX Series inverter/charger	2
PNL-250-DC	250A, 125VDC, 3/8" stud terminals	1
FW-IOBS-120VAC	Single inverter Input-Output-Bypass for FW250 only	1
MATE	System display and communications	1
HUB4	Four port, up to 4 devices and one MATE	1
FLEXnet DC	Multi-channel DC system monitoring device	1
FW-SHUNT250	500A, 50mVDC current shunt with attached terminal bus bar for mounting on top of an FX/VFX Series inverter/charger	1
FW-Cable250-15R	250A, 4/0 AWG DC cable 15 inches (38 cm) long with ring terminals on both ends with red heat shrink	1

Note: This information is a sample only. Additional system configurations and components are available.

*Holds up to (8) 1 to 80A, (1) 175 or 250A panel mount breaker and GFCI AC outlet (not included).

Does not use the DCA or FW-ACA for connection to an FX Series inverter charger. DC current shunt not included.



FLEXware™ 500

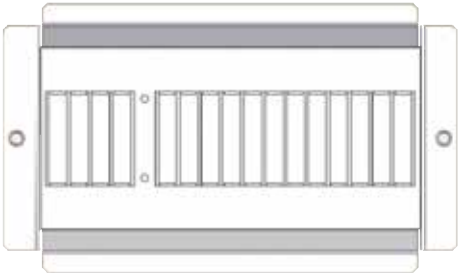
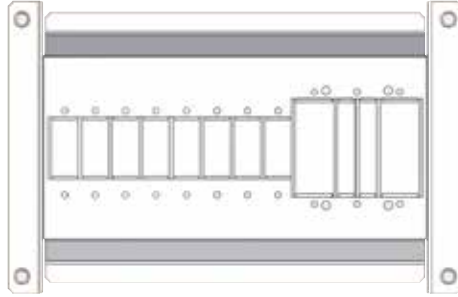
Integration Enclosures and Hardware

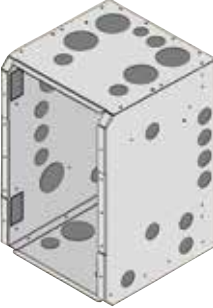
FLEXware 500 Integration Hardware

For applications with medium power requirements such as larger homes, light commercial or larger backup power systems, the FLEXware 500 system architecture can support up to two OutBack FX Series inverter/chargers, up to two OutBack charge controllers and all associated AC and DC components.

With their compact design, FLEXware 500 AC and DC enclosures can mount with a FLEXware Mounting Plate in either a horizontal or vertical orientation to allow installation in more space-limited locations for a fast, professional-looking wall-mounted installation. The FLEXware 500 accommodates all of the essential protective devices in two enclosures. The powder-coated aluminum FLEXware 500 enclosure is ETL listed to UL508A.



Breaker Configuration Diagram	
	
AC Side	DC Side
Holds up to (16) DIN mount AC breakers (not included). Support for optional AC Input-Output-Bypass assembly. AC breakers are rated from 10-60AAC current.	Holds up to (8) 0.75" (19 mm) wide panel mount breakers rated for 1-80ADC current, (3) 1" (26 mm) wide breakers rated for 100 or 125ADC current, or (2) 1.5" (39 mm) wide breakers rated for 175 or 250ADC current.

Knockout Location Diagram		
Left Side	• (5) 1" knockout (1.359" diameter) • (2) 2" knockout (2.468" diameter) • (2) Duplex GFCI outlet knockout	
Right Side	• (9) 1" knockout (1.357" diameter)	
Back Side	• (2) 2" knockout (2.468" diameter)	
Bottom Side	• (3) 1" knockout (1.359" diameter) • (1) 3/4" knockout (1.093" diameter) • (4) 2" knockout (2.468" diameter)	
Top Side	• (3) 1" knockout (1.359" diameter) • (1) 3/4" knockout (1.093" diameter) • (4) 2" knockout (2.468" diameter)	



FLEXware™ 500

Integration Enclosures and Hardware

Models*:	FLEXware 500 DC (FW500-DC)	FLEXware 500 AC (FW500-AC)
Description	DC enclosure which mounts at the DC side of one or two FX Series inverter/chargers. Supports up to (6) terminal bus bars (not including ground busbar) and up to three shunt assemblies depending on configuration	AC enclosure which mounts at the AC side of one or two FX Series inverter/chargers. Supports (6) terminal bus bars and one FW-X240
Includes	Ground bus bar, 500ADC shunt assembly, positive bus, panel breaker mounting hardware, FW-BBUS and enclosure mounting hardware	Ground bus bar, DIN mounting bracket, communication cable conduit and enclosure mounting hardware
Enclosure Type	Type-1 indoor (IP30)	Type-1 indoor (IP30)
Shipping Weight (lb/kg)	15 / 6.8	15 / 6.8
Dimensions H x W x D (in/cm)	Unit: 18.2 x 11.4 x 12.1 / 46.2 x 29 x 30.7 Shipping: 14.5 x 13.4 x 20.3 / 36.8 x 34.1 x 51.6	Unit: 18.2 x 11.4 x 12.1 / 46.2 x 29 x 30.7 Shipping: 14.5 x 13.4 x 20.3 / 36.8 x 34.1 x 51.6

FLEXware 500 AC Input-Output-Bypass Assemblies			
Models:	FW-IOBD-120/240VAC	FW-IOBD-120VAC	FW-IOBD-230VAC
Description	Field-installable kit for by-passing the AC input to the AC output for inverter maintenance, testing or installation. Also provides over-current protection for AC input and output.		
Includes	(6) 60A 120VAC single pole DIN mount breakers, sliding bypass interlock plate, wire and hardware kit	(4) 60A 120VAC single pole DIN mount breakers, (1) 60A 120VAC dual pole DIN mount breaker, sliding bypass interlock plate, wire and hardware kit	(6) 30A 230VAC single pole DIN mount breakers, sliding bypass interlock plate, wire and hardware kit
System Rating	Split-phase 120/240VAC 60A 14.4kW	Single-phase 120VAC 120A 14.4kW	Single-phase 230VAC 60A 13.8kW
Bypass Breaker	Two Poles @ 60A 14.4kW	Two Poles @ 60A 14.4kW	Two Poles @ 30A 13.8kW
Input Breaker	Two Poles @ 60A 14.4kW	Two Poles @ 60A 14.4kW	Two Poles @ 30A 13.8kW
Output Breaker	Two Poles @ 60A 14.4kW	Two Poles @ 60A 14.4kW	Two Poles @ 30A 13.8kW

*The FW500 system utilizes one FW-MP (mounting plate) and a set of the DCA and FW-ACA conduit adapters for each inverter/charger. DC and AC breaker, Input-Output-Bypass assemblies and all other additional components are sold separately.



FLEXware™ 1000

Integration Enclosures and Hardware

FLEXware 1000 Integration Hardware

Designed for applications with larger power requirements such as large residential, commercial, or village power systems. The FLEXware 1000 system architecture is capable of supporting up to four OutBack FX/VFX Series inverter/chargers, four OutBack charge controllers, and all the required AC and DC components and wiring. With their compact design, FLEXware 1000 AC and DC enclosures accommodate all essential protective devices with ample room for additional breakers and large cable connections, and can be mounted either vertically or horizontally. The powder-coated aluminum FLEXware 1000 enclosure is ETL listed to UL508A.



Breaker Configuration Diagram	
AC Side	DC Side
Holds up to (32) DIN mount AC breakers (not included). Support for optional AC Input-Output-Bypass assembly. AC breakers are rated from 10-60AAC current.	Holds up to (11) 0.75" (19 mm) wide panel mount breakers rated for 1-80ADC current, (9) 1" (26 mm) wide breakers rated for 100 or 125ADC current, or (6) 1.5" (39mm) wide breakers rated for 175 or 250ADC current.

Knockout Location Diagram	
Left Side	• (4) 2" knockout (2.468" diameter) • (9) 1" knockout (1.359" diameter) • (2) Duplex GFCI Outlet knockout
Right Side	• (17) 1" knockout (1.359" diameter)
Back Side	• (2) 2" knockout (2.468" diameter) • (2) 1" knockout (1.359" diameter)
Bottom Side	• (3) 1" knockout (1.359" diameter) • (1) 3/4" knockout (1.093" diameter) • (4) 2" knockout (2.468" diameter)
Top Side	• (3) 1" knockout (1.359" diameter) • (1) 3/4" knockout (1.093" diameter) • (4) 2" knockout (2.468" diameter)



FLEXware™ 1000

Integration Enclosures and Hardware

Models*:	FLEXware 1000 DC (FW1000-DC)	FLEXware 1000 AC (FW1000-AC)
Description	DC enclosure which mounts at the DC side of three or four FX/VFX Series inverter/chargers. Supports up to (8) terminal bus bars (not including GBB) and up to (3) shunt assemblies depending on configuration.	AC enclosure which mounts at the AC side of three or four FX/VFX Series inverter/chargers. Supports (8) terminal bus bars and (1) FW-X240.
Includes	Ground bus bar, 1000ADC shunt assembly, positive bus, breaker mounting hardware, enclosure mounting hardware, two FW-SBUS and (1) FLEXware 1000 breaker bus	Ground busbar, two DIN mounting brackets and FLEXware 1000 wiring raceway
Enclosure Type	Type-1 indoor (IP30)	Type-1 indoor (IP30)
Shipping Weight (lb/kg)	21 / 9.5	21 / 9.5
Dimensions H x W x D (in/cm)	Unit: 38.5 x 11.4 x 12.1 / 97.8 x 29.0 x 30.7 Shipping: 14.5 x 13.6 x 40.6 / 36.8 x 34.5 x 103.1	Unit: 38.5 x 11.4 x 12.1 / 97.8 x 29.0 x 30.7 Shipping: 14.5 x 13.6 x 40.6 / 36.8 x 34.5 x 103.1

FLEXware 1000 AC Input-Output-Bypass Assemblies				
Models:	FW-IOBT-120/208VAC	FW-IOBT-230/400VAC	FW-IOBQ-120/240VAC	FW-IOBQ-230VAC
Description	Field-installable kit for by-passing the AC input to the AC output for inverter maintenance, testing or installation. Also provides over-current protection for AC input and output.			
Includes	(9) 60A 120VAC single pole DIN mount breakers, sliding bypass interlock plate, wire and hardware kit	(9) 30A 230VAC single pole DIN mount breakers, sliding bypass interlock plate, wire and hardware kit	(8) 60A 120VAC single pole DIN mount breakers, (2) 60A 120VAC dual pole DIN mount breakers, sliding bypass interlock plate, wire and hardware kit	(12) 30A 230VAC single pole DIN mount breakers, sliding bypass interlock plate, wire and hardware kit
System Rating	Three-phase 120/208VAC, 60A 21.6kW	Three-phase 230/400VAC, 30A 20.7kW	Split-phase 120/240VAC, 120A 28.8kW	Split-phase 230VAC, 120A 27.6kW
Bypass Breaker	Three Poles @ 60A 21.6kW	Three poles 30A 20.7kW	Four poles @60A 28.8kW	Four poles @ 30A 27.6kW
Input Breaker	Three Poles @ 60A 21.6kW	Three poles 30A 20.7kW	Four poles @60A 28.8kW	Four poles @ 30A 27.6kW
Output Breaker	Three Poles @ 60A 21.6kW	Three poles 30A 20.7kW	Four poles @60A 28.8kW	Four poles @ 30A 27.6kW

*The FW1000 system utilizes two FW-MP (mounting plate) and a set of the DCA and FW-ACA conduit adapters for each inverter/charger. DC and AC breaker, Input-Output-Bypass assemblies and all other additional components are sold separately.



Sample Bill of Materials

For FLEXware 500

FW-IOBD-120VAC Sample Bill of Materials (w/one OutBack VFX3648 inverter/charger):

Part Number	Description	Quantity
VFX3648 inverter/charger	3600W, 48VDC, 45A charger, 60AAC input	1
FW-ACA	AC conduit adapter for all FX Series inverter/chargers to AC enclosure	1
DCA	DC Conduit Adapter for all FX Series inverter/chargers to DC enclosure	1
FW500-DC	DC breaker enclosure, fits at the DC side of one or two FX/VFX Series inverter/chargers	1
PNL-175-DC	175A, 125VDC breaker with 3/8" stud terminals	1
FW500-AC	AC breaker enclosure, fits at the AC side of one or two FX/VFX Series inverter/chargers	1
FW-IOBD-120VAC	Dual inverter Input-Output-Bypass for FW500	1
FW-MP	Mounting plate for FW500 or FW1000 system	1
MATE3	System display and communications	1
HUB4	Four port, up to 4 devices and one MATE	1
FN-DC	FLEXnet DC, multi-channel DC system monitoring device	1
FW-Cable175-36R	175A 2/0 AWG DC cable 36" (91.5 cm) long with ring terminals on both ends with red heat shrink	1
FW-Cable175-36W	175A 2/0 AWG DC cable 36" (91.5 cm) long with ring terminals on both ends with white heat shrink	1

FW-IOBD-120/240VAC Sample Bill of Materials (w/dual OutBack VFX3648 inverter/chargers):

Part Number	Description	Quantity
VFX3648 inverter/charger	3600W, 48VDC, 45A charger, 60AAC input	2
FW-ACA	AC Conduit Adapter for all FX/VFX Series inverter/chargers to AC enclosure	2
DCA	DC Conduit Adapter for all FX/VFX Series inverter/chargers to DC enclosure	2
FW500-DC	DC breaker enclosure, fits at the DC side of one or two FX Series inverter/chargers	1
PNL-175-DC	175A, 125VDC breaker with 3/8" stud terminals	2
FW500-AC	AC breaker enclosure, fits at the AC side of one or two FX/VFX Series inverter/chargers	1
FW-IOBD-120/240VAC	Dual inverter Input-Output-Bypass for FW500	1
FW-MP	Mounting plate for FW500 or FW1000 system	1
MATE3	System display and communications	1
HUB4	Four port, up to 4 devices and one MATE	1
FN-DC	FLEXnet DC, multi-channel DC system monitoring device	1
FW-X240	Auto-transformer 4kVA 120/240VAC 60Hz	1
FW-Cable175-36R	175A 2/0 AWG DC cable 36" (91.5 cm) long with ring terminals on both ends with red heat shrink	2
FW-Cable175-36W	175A 2/0 AWG DC cable 36" (91.5 cm) long with ring terminals on both ends with white heat shrink	2

FW-IOBD-230VAC Sample Bill of Materials (w/dual OutBack VFX3024E inverter/charger):

Part Number	Description	Quantity
VFX3024E	3000W, 24VDC, 85ADC charger, 30AAC input	2
FW-ACA	AC Conduit adapter for all FX/VFX Series inverter/chargers to AC enclosure	2
DCA	DC Conduit adapter for all FX/VFX Series inverter/chargers to DC enclosure	2
FW500-DC	DC breaker enclosure, fits at the DC side of one or two FX/VFX Series inverter/chargers	1
PNL-250-DC	250A, 125VDC, 3/8" stud terminals	2
FW500-AC	AC breaker enclosure, fits at the AC side of one or two FX/VFX Series inverter/chargers	1
FW-IOBD-230VAC	Dual inverter Input-Output-Bypass for FW500	1
FW-MP	Mounting plate for FW500 or FW1000 system	1
MATE3	System display and communications	1
HUB4	Four port, up to 4 devices and one MATE	1
FN-DC	FLEXnet DC, multi-channel DC system monitoring device	1
FW-Cable175-36R	250A 4/0 AWG DC cable 36" (91.5cm) long with ring terminals on both ends with red heat shrink	2
FW-Cable175-36W	250A 4/0 AWG DC cable 36" (91.5cm) long with ring terminals on both ends with white heat shrink	2



Sample Bill of Materials

For FLEXware 1000

FW-IOBQ-230VAC Sample Bill of Materials (w/four OutBack VFX3048E inverterchargers in parallel):

Part Number	Description	Quantity
VFX3048E inverter/charger	3000W, 48VDC, 45A charger, 30AAC input	4
FW-ACA	AC Conduit Adapter for all FX/VFX Series inverterchargers to AC enclosure	4
DCA	DC Conduit Adapter for all FX/VFX Series inverterchargers to DC enclosure	4
FW1000-DC	DC breaker enclosure, fits at the DC side of up to four FX/VFX Series inverterchargers	1
PNL-175-DC	175A, 125VDC breaker with 3/8" stud terminals	4
FW1000-AC	AC breaker enclosure, fits at the AC side of up to four FX/VFX Series inverterchargers	1
FW-IOBQ-230VAC	Quad inverter Input-Output-Bypass for FW1000	1
FW-MP	Mounting plate for FW500 or FW1000 system	2
MATE3	System display and communications	1
HUB10.3	Ten port, up to 10 devices and one MATE	1
FN-DC	FLEXnet DC, multi-channel DC system monitoring device	1
FW-Cable175-36R	175A 2/0 AWG DC cable 36" (91.5 cm) long with ring terminals on both ends with red heat shrink	4
FW-Cable175-36W	175A 2/0 AWG DC cable 36" (91.5 cm) long with ring terminals on both ends with white heat shrink	4

FW-IOBQ-120/240VAC Sample Bill of Materials (w/four OutBack VFX3648 inverterchargers in parallel):

Part Number	Description	Quantity
VFX3648 inverter/charger	3600W, 48VDC, 45A charger, 60AAC input	4
FW-ACA	AC Conduit Adapter for all FX/VFX Series inverterchargers to AC enclosure	4
DCA	DC Conduit Adapter for all FX/VFX Series inverterchargers to DC enclosure	4
FW1000-DC	DC breaker enclosure, fits at the DC side of one or two FX/VFX Series inverterchargers	1
PNL-175-DC	175A, 125VDC breaker with 3/8" stud terminals	4
FW1000-AC	AC breaker enclosure, fits at the AC side of one or two FX/VFX Series inverterchargers	1
FW-IOBQ-120/240VAC	Tri inverter Input-Output-Bypass for FW1000	1
FW-MP	Mounting plate for FW500 or FW1000 system	2
MATE3	System display and communications	1
HUB10.3	Ten port, up to 10 devices and one MATE	1
FN-DC	FLEXnet DC, multi-channel DC system monitoring device	1
FW-X240	Auto-transformer 4kVA 120/240VAC 60Hz	1
FW-Cable175-36R	175A 2/0 AWG DC cable 36" (91.5 cm) long with ring terminals on both ends with red heat shrink	4
FW-Cable175-36W	175A 2/0 AWG DC cable 36" (91.5 cm) long with ring terminals on both ends with white heat shrink	4

FW-IOBT-120/208VAC Sample Bill of Materials (w/three OutBack VFX3648 inverterchargers for three-phase):

Part Number	Description	Quantity
VFX3648 inverter/charger	3600W, 48VDC, 45A charger, 60AAC input	3
FW-ACA	AC Conduit adapter for all FX/VFX Series inverterchargers to AC enclosure	3
DCA	DC Conduit adapter for all FX/VFX Series inverterchargers to DC enclosure	3
FW1000-DC	DC breaker enclosure, fits at the DC side of one or two FX/VFX Series inverterchargers	1
PNL-175-DC	175A, 125VDC, 3/8" stud terminals	3
FW1000-AC	AC breaker enclosure, fits at the AC side of one or two FX/VFX Series inverterchargers	1
FW-IOBT-120/208VAC	Tri inverter Input-Output-Bypass for FW1000	1
FW-MP	Mounting plate for FW500 or FW1000 system	2
MATE3	System display and communications	1
HUB10.3	Ten port, up to 10 devices and one MATE	1
FN-DC	FLEXnet DC, multi-channel DC system monitoring device	1
FW-Cable175-36R	175A 2/0 AWG DC cable 36" (91.5 cm) long with ring terminals on both ends with red heat shrink	3
FW-Cable175-36W	175A 2/0 AWG DC cable 36" (91.5 cm) long with ring terminals on both ends with white heat shrink	3



FLEXware™ Surge Protector

Transient Overvoltage Surge Suppression

FLEXware Transient Surge Protectors

The FLEXware Surge Protector was designed by OutBack engineers specifically for OutBack FX/VFX Series inverter/chargers to provide multiple levels of protection for an inverter/charger's vital parts in the event of an electrical power surge. Ease of installation and seamless integration make it an obvious addition to any OutBack system.

Advanced design allows for both AC and DC protection on multiple circuits (two AC and one DC) via thermally fused Metal Oxide Varistors (MOVs). LED visual indicators provide at-a-glance status monitoring allowing system users to determine FLEXware Surge Protector operational status in real-time.

The FLEXware Surge Protector is designed to operate between 120 to 240VAC at 50/60Hz and 12 to 48VDC. Multiple mounting configurations allow it to be incorporated into any OutBack system for quicker installations that look as good as they perform. The FW-SP-ACA mounts inside the FW-ACA for FLEXware 500 and 1000 systems, while the FW-SP-250 is designed to mount inside the FLEXware 250 AC Side Breaker Enclosure.

The OutBack Power FLEXware Surge Protector is the logical choice for protecting an FX/VFX Series inverter/charger investment from the harmful effects of transient power surges.



Models:	FW-SP-ACA	FW-SP-250	FW-SP-R
Nominal Voltage	120-240VAC/12-48VDC	120-240VAC/12-48VDC	120-240VAC/12-48VDC
Voltage Protection Level	390VAC/150VDC	390VAC/150VDC	390VAC/150VDC
AC or DC	AC/DC	AC/DC	AC/DC
Maximum Surge Current (8/20μs)	30kA per circuit	30kA per circuit	30kA per circuit
Energy Rating	2500 joules	2500 joules	2500 joules
Frequency	50/60Hz	50/60Hz	50/60Hz
Protection Type	Thermally Fused MOV	Thermally Fused MOV	Thermally Fused MOV
Number of Protected Circuits	(2) AC and (1) DC	(2) AC and (1) DC	(2) AC and (1) DC
Mounting	FW-ACA	FW-250	Replacement Board (FW-SP-ACA, FW-SP-250)
Operating Temperature Range	-40 to 60°C	-40 to 60°C	-40 to 60°C
Weight (lb/kg)	Unit: 1.3 / 0.57 Shipping: 2.1 / 0.96	Unit: 1.15 / 0.52 Shipping: 2 / 0.91	Unit: 0.47 / 0.21 Shipping: 1.15 / 0.52
Dimensions H x W x L (in/cm)	Unit: 8.5 x 6.75 x 2.5 / 21.59 x 17.15 x 6.35 Shipping: 10.13 x 9.13 x 5.75 / 25.72 x 23.2 x 14.6	Unit: 5.5 x 6.5 x 7.5 / 13.97 x 16.51 x 19.05 Shipping: 10 x 7.25 x 6 / 25.4 x 18.42 x 15.24	Unit: 7.75 x 5.5 x 1.5 / 19.69 x 13.97 x 3.81 Shipping: 9.38 x 7.25 x 2.5 / 23.81 x 18.42 x 6.35



PSX-240

Auto-Transformer



PSX-240 Auto-Transformer

The OutBack PSX-240 (6kVA) auto-transformer can be used for step-up, step-down, generator and split-phase output balancing or as a series stacked inverter to load balancing autoformer. Incorporating a transformer with 120V/30A primary and secondary side, a temperature activated cooling fan and a 25A dual pole breaker in a steel enclosure, the PSX-240 is ready to install in your custom application. Use for 120 or 240VAC 60Hz systems only.

FW-X240 Auto-Transformer

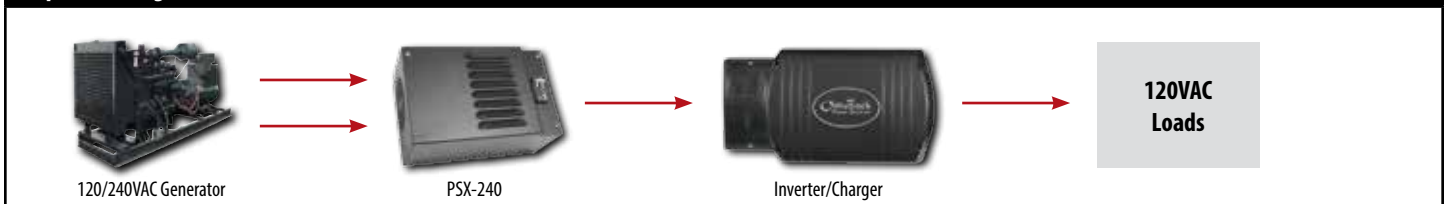
Designed to be housed within the FLEXware 500 or FLEXware 1000 AC enclosures, the FW-X240 (4kVA) auto-transformer can be used for step-up, step-down, generator and split-phase output balancing or as a series stacked inverter to load balancing autoformer. Includes transformer, 25A dual pole breaker and mounting hardware. Use for 120 or 240VAC 60Hz systems only.

Models:	PSX-240	FW-X240
Weight (lb/kg)	Unit: 37.7 / 17.1 Shipping: 39.5 / 17.9	Unit: 28.4 / 12.9 Shipping: 32.5 / 14.7
Dimensions H x W x L (in/cm)	Unit: 6.25 x 8 x 12.5 / 15.9 x 20.3 x 31.75 Shipping: 10.25 x 12.25 x 16.25 / 26 x 31.1 x 33	Unit: 5.38 x 6.38 x 5.31 / 13.67 x 16.21 x 13.49 Shipping: 10.75 x 10.75 x 10.75 / 27 x 27 x 27

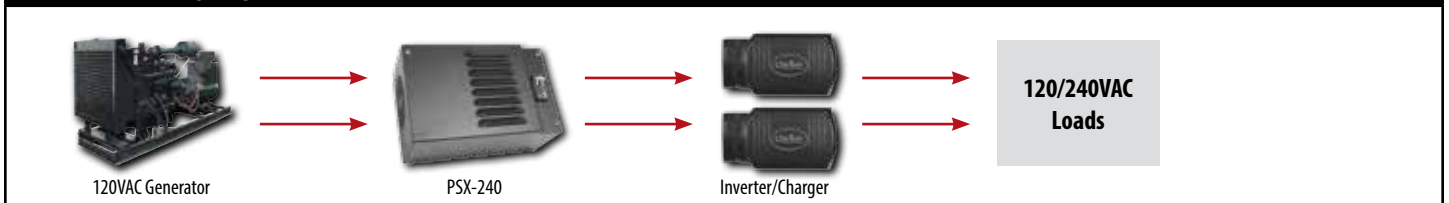
Step-Up Diagram



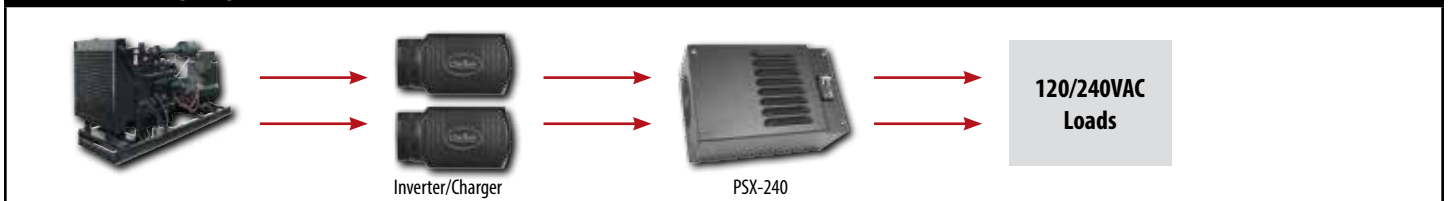
Step-Down Diagram



Generator Balancing Diagram



OutBack Balancing Diagram





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System Components and Accessories



OutBack Panel Mount Breakers

Panel mounted hydraulic-magnetic type breakers that can be used for DC sources, inverters or load circuits

Model	Current Rating	Voltage Rating	Branch Circuit	Terminals	Width (in/mm)
PNL-1-AC/DC*	1A	150VDC 120VAC	10k AIC	1/4" stud	0.75 / 19
PNL-5-AC/DC*	5A	150VDC 120VAC	10k AIC	1/4" stud	0.75 / 19
PNL-10-AC/DC*	10A	150VDC 120VAC	10k AIC	1/4" stud	0.75 / 19
PNL-15-AC/DC*	15A	150VDC 120VAC	10k AIC	1/4" stud	0.75 / 19
PNL-20-AC/DC*	20A	150VDC 120VAC	10k AIC	1/4" stud	0.75 / 19
PNL-30-AC/DC*	30A	150VDC 120VAC	10k AIC	1/4" stud	0.75 / 19
PNL-30-AC	30A	250VAC	—	1/4" stud	0.75 / 19
PNL-40-AC/DC*	40A	150VDC 120VAC	10k AIC	1/4" stud	0.75 / 19
PNL-50-AC/DC*	50A	150VDC 120VAC	10k AIC	1/4" stud	0.75 / 19
PNL-60-AC/DC*	60A	150VDC 120VAC	10k AIC	1/4" stud	0.75 / 19
PNL-80-DC*	80A	150VDC	—	1/4" stud	0.75 / 19
PNL-100-DC	100A	125VDC	—	5/16" stud	1 / 26
PNL-125-DC	125A	125VDC	—	5/16" stud	1 / 26
PNL-175-DC	175A	125VDC	—	3/8" stud	1.5 / 39
PNL-250-DC	250A	125VDC	—	3/8" stud	1.5 / 39
PNL-50D-AC-120/240	50A (each of 2 poles)	120/240VAC	5k AIC	1/4" stud	1.5 / 39



OutBack DIN Breakers

DIN rail mountable, hydraulic-magnetic type breakers that can be used for input, output or load circuits

Model	Current Rating	Voltage Rating	Branch Circuit	Variation	Width (in/mm)
DIN-15-AC	15A	120VAC 50/60Hz	10k AIC	Single pole	0.5 / 13
DIN-15D-AC	15A	120/240VAC 50/60Hz	10k AIC	Dual pole	1 / 26
DIN-20-AC	20A	120VAC 50/60Hz	10k AIC	Single pole	0.5 / 13
DIN-20D-AC	20A	120/240VAC 50/60Hz	10k AIC	Dual pole	1 / 26
DIN-25D-AC	25A	120/240VAC 50/60Hz	10k AIC	Dual pole	1 / 26
DIN-10-AC-277	10A	277VAC 50/60Hz	—	Single pole	0.5 / 13
DIN-15-AC-277	15A	277VAC 50/60Hz	—	Single pole	0.5 / 13
DIN-30-AC-277	30A	277VAC 50/60Hz	—	Single pole	0.5 / 13
DIN-30D-AC-480	30A	277/480VAC 50/60Hz	—	Dual pole	1 / 26
DIN-30T-AC-480	30A	277/480VAC 50/60Hz	—	Three pole	1.5 / 39
DIN-50-AC-277	50A	277VAC 50/60Hz	—	Single pole	0.5 / 13
DIN-50D-AC-480	50A	277/480VAC 50/60Hz	—	Dual pole	1 / 26
DIN-50T-AC-480	50A	277/480VAC 50/60Hz	—	Three pole	1.5 / 39
DIN-60-AC-277	60A	277VAC 50/60Hz	—	Single pole	0.5 / 13
DIN-60D-AC-480	60A	277/480VAC 50/60Hz	—	Dual pole	1 / 26



System Components and Accessories

OutBack PV Ground-Fault Detection and Interruption System

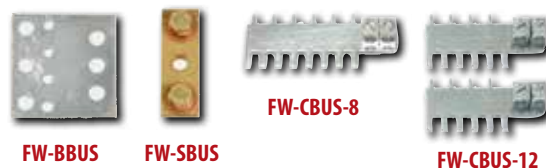
Ground fault detection and interruption is required by the NEC as a safety precaution. The OutBack PV Ground-Fault Detection and Interruption System protects wiring and system components for one, two or four PV arrays when used in a GSLC, FLEXware 250, FLEXware 500 or FLEXware 1000.



Model*	Description	Terminals	Width (in/cm)
PNL-GFDI-80	PV ground-fault detector interrupter, 80A 150VDC single pole panel mount	1/4" stud	1.51 / 3.85
PNL-GFDI-80D	PV ground-fault detector interrupter, 80A 150VDC two pole panel mount	1/4" stud	2.26 / 5.73
PNL-GFDI-80Q	PV ground-fault detector interrupter, 80A 150VDC four pole panel mount	1/4" stud	3.78 / 9.59

DC Bus Bars

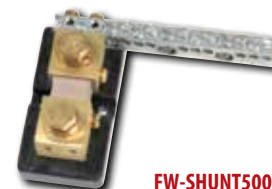
OutBack DC bus bars are designed to enable the most complex of code compliant DC cable connections.



Model	Description	Includes
FW-BBUS	Breaker bus allows connection of (2) 175-250A, (3) 100-125A, (4) 1-80ADC breakers or (3) 500ADC current shunts	Plated copper plate rated for 500A
FW-SBUS	Shunt bus allows up to (4) high current cable connections on same side of DC shunt	Plated copper plate rated for 500A and (2) 5/16 inch bolts for mounting
FW-CBUS-8	Combiner bus connects up to (8) DIN mounted breakers or (6) DIN mounted fuse holders	(2) 2/0 AWG box lug terminals; plated copper
FW-CBUS-12	Combiner bus connects up to (12) DIN mounted breakers or (8) DIN mounted fuse holders	(2) 2/0 AWG box lug terminals; plated copper

DC Current Shunts

When used with an amp hour meter, OutBack Power DC current shunt kits can provide valuable insight into the status of batteries or DC power source. One shunt kit is included standard on FLEXware 500 and FLEXware 1000 DC enclosures.



Model	Description	Includes
FW-SHUNT250	500ADC current shunt with terminal bus bar for mounting on top of the FX Series inverter/charger	Shunt, mounting hardware and terminal bus bar for connection to FX inverter/charger's DC negative terminal
FW-SHUNT500	500ADC current shunt with terminal bus bar	Shunt, terminal bus bar and one white insulator and mounting screws

*Uses two, three or five 3/4" wide panel mount breaker spaces.



System Components and Accessories

Conduit Adapters

Allows connection of the FX/VFX Series inverter/chargers to FLEXware 500 and FLEXware 1000 enclosures, one FW-ACA and DCA required per FX Series inverter/charger.

Model	Description	Includes
FW-ACA	Adapter for AC end of FX Series inverter/charger	FW-ACA and mounting hardware
DCA	Adapter for DC end of FX Series inverter/charger	DCA, bushing and mounting hardware

Mounting Brackets

FW-CCB and FW-CCB2 mounting brackets allow OutBack Power charge controllers to be mounted on the side of FW500-DC, FW1000-DC or GSLC enclosures. FW-CCB2-T mounting bracket allows OutBack Power charge controllers to be mounted on the top of FW500-DC or FW1000-DC enclosures. FW-MB1 mounting bracket allows mounting OutBack Power charge controllers and MATE system display and communications to FLEXware 500, FLEXware 1000 and Radian Series enclosures.



Model	Description
FW-CCB	Bracket for mounting a single FLEXmax Series charge controller on the side of FW500, FW1000 or GSLC enclosures
FW-CCB2	Bracket for mounting two FLEXmax Series charge controller on the side of FW500, FW1000 or GSLC enclosures
FW-CCB2-T	Bracket for top mounting two FLEXmax Series charge controllers on the top of FW500 and FW1000 enclosures
FW-MB1	Bracket for mounting a MATE system display on the side of FW500 and FW1000 enclosures
FW-MB2	Bracket for mounting a MATE2 system display on the side of FW500 and FW1000 enclosures
FW-MB3	Bracket for mounting a MATE3 system display on the side of Radian, GSLC, FW500 and FW1000 DC enclosures
FW-MB3-F	Flat-mount MATE3 system display mounting plate for installation over standard electrical boxes
FW-MB3-S	Surface-mount MATE3 system display mounting bracket

DIN Rail End Clamp

Model	Description	Width (in/mm)
FW-EC-DIN	DIN rail mountable securing device for DIN rail mountable fuse holders or breakers	0.4 / 10



System Components and Accessories

DC Cable Assemblies*

DC interconnect cable assemblies for wiring between inverter/chargers and breakers or DC shunts. Can also be used as battery interconnects. The THW type cable assemblies are UL listed and NEC compliant with a maximum voltage rating of 1000VDC and a temperature rating of 105°C.

Model	Description	Hole to Hole Length (in/cm)
FW-CABLE250-15R	250A 4/0 AWG (11.7 mm) DC cable 15 inches (38 cm) long with ring terminals on both ends and red heat shrink. For connection from 250ADC breaker to inverter positive terminal.	19 / 48.3
FW-CABLE175-15R	175A 2/0 AWG (9.26 mm) DC cable 15 inches (38 cm) long with ring terminals on both ends and red heat shrink. For connection from 175ADC breaker to inverter positive terminal.	40 / 101.6
FW-CABLE250-36R	250A 4/0 AWG (11.7 mm) DC cable 36 inches (91.5 cm) long with ring terminals on both ends and red heat shrink. For connection from 250ADC breaker to inverter positive terminal.	19 / 48.3
FW-CABLE175-36R	175A 2/0 AWG (9.26 mm) DC cable 36 inches (91.5 cm) long with ring terminals on both ends and red heat shrink. For connection from 175ADC breaker to inverter positive terminal.	40 / 101.6
FW-CABLE250-36W	250A 4/0 AWG (11.7 mm) DC cable 36 inches (91.5 cm) long with ring terminals on both ends and white heat shrink. For connection from DC current shunt to inverter negative terminal.	40 / 101.6
FW-CABLE175-36W	175A 2/0 AWG (9.26 mm) DC cable 36 inches (91.5 cm) long with ring terminals on both ends and white heat shrink. For connection from DC current shunt to inverter negative terminal.	40 / 101.6

OutBack DC DIN Mount Breakers

DIN rail mount breakers are hydraulic-magnetic type and are not affected by high ambient temperatures.

Model	Current Rating	Voltage Rating**	Terminals	Width (in/mm)
DIN-1-DC	1A	125VDC	#14 to 2 AWG clamp terminals	0.5 / 13
DIN-2-DC	2A	150VDC	#14 to 2 AWG clamp terminals	0.5 / 13
DIN-3-DC	3A	150VDC	#14 to 2 AWG clamp terminals	0.5 / 13
DIN-4-DC	4A	150VDC	#14 to 2 AWG clamp terminals	0.5 / 13
DIN-5-DC	5A	150VDC	#14 to 2 AWG clamp terminals	0.5 / 13
DIN-6-DC	6A	150VDC	#14 to 2 AWG clamp terminals	0.5 / 13
DIN-8-DC	8A	150VDC	#14 to 2 AWG clamp terminals	0.5 / 13
DIN-9-DC	9A	150VDC	#14 to 2 AWG clamp terminals	0.5 / 13
DIN-10-DC	10A	150VDC	#14 to 2 AWG clamp terminals	0.5 / 13
DIN-15-DC	15A	150VDC	#14 to 2 AWG clamp terminals	0.5 / 13
DIN-20-DC	20A	125VDC	#14 to 2 AWG clamp terminals	0.5 / 13
DIN-30-DC	30A	125VDC	#14 to 2 AWG clamp terminals	0.5 / 13
DIN-50-DC	50A	125VDC	#14 to 2 AWG clamp terminals	0.5 / 13
DIN-60-DC	60A	125VDC	#14 to 2 AWG clamp terminals	0.5 / 13

*All ring lugs have 3/8" (9.53mm) diameter hole.

**Approved for maximum VOC of 150VDC by ETL for PV array applications only.



System Components and Accessories

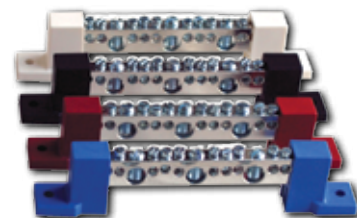
OutBack High Voltage DIN Mount Fuse Holders and Fuses

Fuse holders are DIN rail mount with #8 AWG set-screw type compression terminals. Touch-safe design and not rated for load make or load break usage.

Model	Description	Current Rating	Voltage Rating	Width (in/mm)
OBF-6-600VDC	Fuse	6A	600VDC	—
OBF-10-600VDC	Fuse	10A	600VDC	—
OBF-15-600VDC	Fuse	15A	600VDC	—
OBFH-30-600VDC-DIN	Fuse holder	30A	600VDC	0.7 / 18
FUSE-15-600VDC/10	Carton of (10) fuses	15A	600VDC	—
FUSE-20-600VDC/10	Carton of (10) fuses	20A	600VDC	—
FH-30-1000VDC-DIN	Fuse holder	30A	1000VDC	0.7 / 18

Terminal Bus Bars

Used for adding more wire terminations or for isolating multiple positive/negative circuits. All TBB models have three #1/0 to 14 AWG and eight #6 to 14 AWG screw type compression terminals, which means no ring lugs are required. Available with black, white, red, blue and brown insulators. All required TBBs are included with the AC Input-Output-Bypass Assemblies. TBBs are rated for a maximum of 180AAC/ADC.



Model	Description	Terminals
TBB-GROUND	Ground/Neutral terminal bus bar and mounting screws (no insulators)	(3) #1/0 to 14 AWG and (8) #6 to 14 AWG screw type compression
TBB-BLACK	Bus bar with black insulators and mounting screws	(3) #1/0 to 14 AWG and (8) #6 to 14 AWG screw type compression
TBB-BLUE	Bus bar with blue insulators and mounting screws	(3) #1/0 to 14 AWG and (8) #6 to 14 AWG screw type compression
TBB-RED	Bus bar with red insulators and mounting screws	(3) #1/0 to 14 AWG and (8) #6 to 14 AWG screw type compression
TBB-WHITE	Bus bar with white insulators and mounting screws	(3) #1/0 to 14 AWG and (8) #6 to 14 AWG screw type compression
TBB-BROWN	Bus bar with brown insulators and mounting screws	(3) #1/0 to 14 AWG and (8) #6 to 14 AWG screw type compression



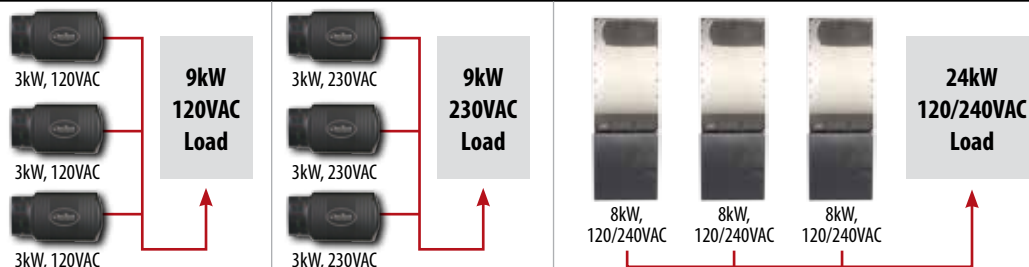
System Stacking Configurations

OutBack adheres to a philosophy that a power system should be fully customizable to address your specific needs. Therefore, the company set out to create the world's first group of inverter/chargers that use a truly modular architecture. This modular architecture uses the next generation of a technique referred to as "stacking" to enable you to tailor your system for higher output power, increased charging capabilities and/or three-phase power configuration.

Whether stacked in parallel, classic series, series/parallel or three-phase there is always an inverter/charger which performs the task of master. Depending on the model, the master talks to the other units through the HUB system communications manager while performing three major roles, keeping all inverter/chargers properly phased, controlling inverter and charger output levels, as well as putting unused inverters into "Power Save" mode to improve system efficiency at low AC load levels.

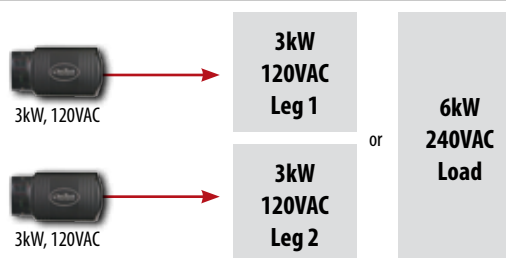
Parallel Stacking (More Power at Same Output Voltage)

When the inverter/chargers are stacked in parallel all inverter and charger outputs are combined. This means that each inverter's AC output is added up to equal your total system AC output, up to 36,000W, in phase at the same 120VAC/60Hz or 230VAC/50Hz output voltage, or 80,000W at 120/240VAC/60Hz with the Radian Series.



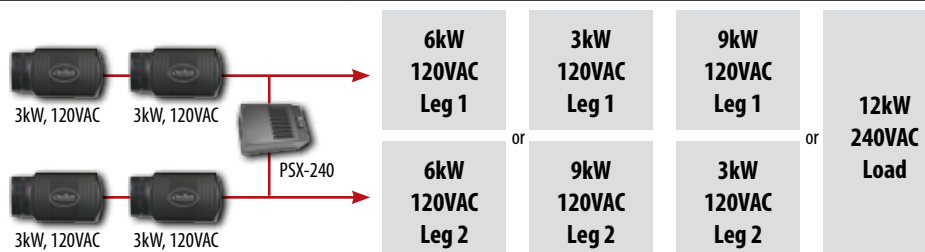
Classic Series Stacking (More Power at Higher Output Voltage)

Stacking inverter/chargers in classic series provides a system with split phase 120/240VAC. This method does not allow balancing between separate legs on a system and can only be used in dual inverter/charger systems without an Auto Transformer.



OutBack Series/Parallel Stacking (More Power at All Output Voltage)

Series/parallel stacking or OutBack stacking is unique to OutBack inverter/chargers. Never before has it been possible to have inverter/chargers balancing loads intelligently between two legs of AC power while seamlessly changing between series and parallel. OutBack stacking uses the PSX-240 auto transformer to balance the loads between the two separate legs of a system. The PSX-240 allows AC loads on leg 1 and leg 2 to be powered by any combination of inverter/chargers within your system. Even if there are only two inverter/chargers, connected in series, they can function as if connected in parallel. This allows larger AC loads to be operated by a system without risking overloading one of the 120VAC outputs.



Three-Phase Stacking (More Power for Three-Phase Loads)

Three inverter/chargers can be configured to provide 120/208VAC or 230/400VAC four wire "WYE/Star" three-phase AC Power. An inverter/charger is used to power each of the three legs for three-phase AC power. The loads on each of the inverters do not need to be kept balanced—each phase is independently voltage regulated.



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